INDIA RUBBER WORLD
FOUNDED 1889
CAOUTCHOUC GUTTA-PERCHA
Reg. United States Pat. Off. Reg. United Kingdom.
Published on the 1st of each month by
THE INDIA RUBBER PUBLISHING CO.
No. 25 West 45th Street, New York.
Telephone—Bryant 2576.
CABLE ADDRESS: IRWORLD, NEW YORK.
HENRY C. PEARSON, F.R.G.S., Editor
Vol. 59. MARCH 1, 1919. No. 6.

SUBSCRIPTIONS: $3.00 per year, $1.75 for six months, postpaid, for the United States and dependencies and Mexico. To the Dominion of Canada and all other countries, $3.50 (or equivalent funds) per year, postpaid.

ADVERTISING: Rates will be made known on application.

REMITTANCES: Should always be made by bank draft, Post Office or Express money order on New York, payable to THE INDIA RUBBER PUBLISHING COMPANY. Remittances for foreign subscriptions should be sent by International Postal Order, payable as above.

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THE LUXURY TAX ON TIRES.

WILL the passenger automobile ever live down its unwarranted reputation as a pleasure vehicle? Nothing has ever been adduced to refute the statement of Colonel Colt that only ten per cent of the passenger automobiles of the country are used primarily for pleasure purposes, yet House and Senate conferees have agreed to a luxury tax of five per cent on manufacturers' sales of motor vehicles, tires and accessories. The efficiency of modern business indisputably depends to a remarkable degree upon the use of passenger automobiles by executives, superintendents, managers, salesmen and others. The injustice of levying a luxury tax on commercial vehicles requires no argument. It is difficult to understand what logic justifies the assumption that ninety per cent of the users of motor vehicles and tires should pay a luxury tax that properly applies only to the other ten per cent. Cars and tires have ceased to be luxuries.

The plan of our Solons seems to be to tax wealth, thrift, and industry. Why not try another plan? Tax the idle, the lazy, the vicious. Put a head tax on agitators, on aliens, I. W. W.'s and Bolshevists. As to the last three, make it prohibitive, if that is possible, in the light of their ample funds.

WOULD USE NINE MILLION POUNDS OF GUTTA.

PROFESSOR LLEWELLYN PREECE, of the Institute of Electrical Engineers, proposes an elaborate scheme to enable the British Government to possess its own "All-British round-the-world electric girdle." His plan is a cable 30,000 miles long—3,000 miles across British America and 27,000 miles of submarine cables—every terminus of which would be on British territory.

Such an independent system would be of advantage politically as well as commercially, and the veteran scientist strongly recommends this great undertaking even though the present cable systems cover nearly, or quite all the routes suggested.

The manufacture and successful laying of 27,000 miles of submarine cable is an immense undertaking. The professor thinks it should cost not over $34,000,000, or if the present Pacific cable were utilized, perhaps $24,000,000. To prove that this estimate is low it is only necessary to consider one item, gutta percha.

Practically all the submarine cables are insulated with this valuable mineral. They vary but moderately in the amount of the gutta per mile. The French cable, Brest to New York, contains 396 pounds per mile; the Vancouver-Fanning cable, 340 pounds; the Mackay-Bennett, 320 pounds. The Pacific cable has less at deep-sea portions than near land and varies from 250 to 400 pounds, with an average of 330 pounds to the mile. Other important cables have 400, 368, 325 and 320 pounds per mile. Taking 330 pounds as a reasonable average, 8,910,000 pounds of gutta percha would be required. The cost at the present market quotations, $3 per pound, would be more than $25,000,000, leaving only $9,000,000 of Professor Preece's estimate for the entire cost of copper wire and sheathing, besides manufacturing costs, laying and installing.

Should this amount, nearly 9,000,000 pounds of gutta percha, be needed, where would it come from? The world's annual production is estimated at 5,000,000 pounds, but this also includes gutta siak which is useless for insulation. There is practically no gutta percha in the market. Nor is there such amount in stock anywhere in the world to-day, except perhaps unextracted in the trees of the Far East.

However, although European manufacturers rely solely on gutta percha for insulating submarine cables, American manufacturers have successfully utilized rubber for this purpose, and while the longest stretch of such cable is only about 800 miles, it has withstood Arctic cold over land and under water as well as any gutta-protected one. In some short cables it is also claimed that rubber properly applied on tin-coated copper conductors has proved better than gutta percha in tropical waters infested with the Teredo.

Should the British Government adopt Professor Preece's plan, it is more than likely that the manufacturers of that nine thousand leagues of cable under the

sea would be obliged to insulate with rubber or wait many years and pay a larger price than the Professor estimates.

ANTIDOTES FOR BOLSHEVISM.

ONE of the marked results of the war upon Americans is the inculcation of the principle of thrift. The wonderful response of all classes to the call of the nation to purchase Liberty Bonds and Thrift Stamps has popularized saving and investing. As a consequence those who never before saved any of their earnings have become bond-holders, bank-depositors and investors.

The same sort of education has been given for two years by President Rieder of the Canadian Consolidated Rubber Co., who introduced a plan whereby employes could leave part of their wages with the company and receive interest at the rate of six per cent per annum, compounded monthly. Naturally there were some overcautious employes who at first feared that the company had some ulterior motive. When they learned, however, that they could withdraw any part or the whole of their deposits at any time, these suspicions departed and the plan has been proved a success. It has resulted not only in the pride of the employes in investment, but in their increased stability and faithfulness. Those who have thus invested earnings have also a greater interest in the company and its work, and are much better workmen.

The rubber company mentioned is but one of many in this country and Canada where similar plans have been tried and in no case has it proved other than advantageous to both employer and employe. Furthermore an I. W. W. or a Bolshevist is anathema to an investing employe, for is he not a capitalist?

No one can read the names of the dead and wounded soldiers which have been published in the daily papers without being impressed by the cosmopolitanism of our army. Truly every race and nation is represented, yet all these men, by their participation in the war, as units in the United States Army, have fully earned the title "American."

The pay roll of every large rubber concern presents a similar variety of racial surnames. The notices posted in the factories, printed in several languages, show the polyglot character of the rank and file of the work people.

The tendency of immigrants is to segregate into racial groups which, except for their work, remain as alien as though they were still in their native countries. In many cases there is slight endeavor on their part to learn the language of this country, no sympathy with things American nor appreciation of that thoroughness that makes for the highest efficiency.

That all workmen should understand English is of the first importance. And next to learning the language of their adopted country is to know its principles of equality, fair play and justice. Only by such means can the industries of this country be assured of progress and prosperity. The workman who understands that what is for the common good of both employer and employe is ultimately best for each individual, himself included, is the only valuable one. As a means toward this end leading rubber manufacturers are maintaining schools where the English language is taught and at the same time the advantage of becoming American citizens is made plain.

Were every factory manned by English-speaking, self-respecting money-saving American citizens, native or naturalized, there would be little labor trouble, less fear of I. W. W.-ism and Bolshevism.

MEXICAN RUBBER LOOKING UP.

THE Intercontinental Rubber Co. and some forty other big oil, copper, and land companies, together with big banks such as the National City, the Guaranty Trust and J. P. Morgan, are out to reconstruct Mexico. As a beginning they have formed the National Association for the Protection of American Rights in Mexico. As our neighbor to the south is bankrupt, a receivership is planned, this to be brought about by the moral suasion of the civilized world. Armed intervention is not planned. Instead, wise and efficient support of a stable Mexican government is to be offered,—perhaps insisted upon.

It is high time and it is, moreover, the time. German propaganda is slumping more and more. Teutonic money that formerly was poured out by millions is becoming scarce. Hun promises and boasts are beginning to be understood for what they are worth. Arms and ammunition for insurrectos are hard to get. Besides this, thousands of Mexicans on both sides of the border are enthusiastically in favor of the plan.

A wisely administered receivership means peace for the Mexicans, safety for foreigners, and renewed prosperity for the rubber plantations, and the guayule producers.

THE DAILY PAPERS ARE FEATURING A STORY TO THE effect that one man was killed and two women burned by the explosion of a hot-water bottle, and furthermore that the explosion was heard for blocks and several windows broken.

The inference is that the bottle contained hot water; that said hot water suddenly, energetically, and feloniously, turned itself into steam and did rend, wreck and scald, to the discomfort and damage of certain and sundry individuals. Without in any way impugning the veracity of the narrators, we venture to point out that hot water is not explosive. Even in a superheated bed its contents do not vaporize. The chances are that the bottle was filled with T.N.T., which conservative manufacturers do not advise for foot warming.

THE FOUR-MILLION-DOLLAR POTASH PLANT, NEAR SAN Diego, California, is to be shut down. As it made potash from kelp this is a rare opportunity for some manufacturer of "seaweed rubber."

The Production of Guayule Rubber.

From a special report by Henry C. Pearson, prepared for the Bureau of Foreign and Domestic Commerce.

EVEN before the Spanish occupation northern Mexico was a rubber-producing country, the source being a shrub or dwarf tree to-day known as guayule. The natives obtained the gum by chewing the bark and made toy balls of it. It is said that this fact was first chronicled by a Jesuit priest, Negrete, about the middle of the eighteenth century.

The plant was discovered by Dr. J. M. Bigelow, in 1852, when he was attached to the Mexican Boundary Survey. It was later described and named *Parthenium argentatum* by Professor Asa Gray, of Harvard University.

In 1876 a guayule product, known as Durango rubber, was exhibited at the Philadelphia Centennial Exposition. Attention was drawn again to it in 1886, when an English mining engineer, working in Mexico, reported to his principals that he had found "an enormous quantity of a plant that yielded 10 per cent of rubber."

It was not until 1888, however, that any attempt was made to extract the gum commercially. In that year John H. Cheever, the founder and at that time the treasurer of the New York Belting & Packing Co., New York, imported 100,000 pounds of the shrub, known as "hule." The bark when removed yielded about 18 per cent of rubber, which was considered equal to the best grade of "centrals." Because of the expense of transportation and treatment the experiment was not repeated.

TYPICAL GUAYULE COUNTRY.

In 1896 Guillermo Vogel, of Mexico City, sent samples of the shrub and rubber from it to manufacturers in the United States, but they attracted little attention.

Germans in Mexico endeavored to interest American capital in the extraction of the gum in the late nineties with little success. That some of the shrub or bark was sent to Germany was certain, but the trade heard nothing of it.

DEVELOPMENT OF EXTRACTION PROCESSES.

In 1899 William Prampolini, an Italian, took out a patent for extracting guayule by solvents. His apparatus was constructed at Monterey, Mexico, but was only experimental. Two years later the Bergner process was patented in Mexico, and this was followed by a large number of patents for extraction processes, some practical and some otherwise, and for several years afterwards applications for patents for this purpose were numerous.

In 1903 a small factory was established at Jimulco, Mexico, by Adolpho Marx.

In 1905 a factory in Germany, backed by large financial interests, did a successful business extracting the guayule from the shrub, which was gathered in Mexico, baled, and shipped to Germany. The Mexican Government, however, placed an export duty of 15 pesos per ton on the shrub, which, with the cost of gathering and transportation, rendered the industry unprofitable.

Beginning in 1902, certain American capitalists financed a series of experiments that led to an invention by William A. Lawrence, by which, in 1904, rubber was extracted by a mechanical process, and 50 pounds were shipped to the United States. This was the real beginning of the extraction of guayule on a commercial basis in Mexico, and in 1906 it began to be used in quantity. Factories established in the States of Durango, Coahuila, San Luis Potosi, and in Texas soon produced large quantities of rubber. Improvements in the processes of extraction tended to produce superior grades, and the guayule industry was fully established on a profitable basis. The rival companies, though strongly competing, were able to secure good prices and the question of a supply of the shrub became important. This led to the purchase of large tracts where the shrub was plentiful and the erection of extraction plants in many little-known sections of Mexico.

In 1907 the leading producers were companies briefly designated as the Continental, the Madero, and the Anglo-Mexicana. The Continental-Mexican Rubber Co. had its principal plant at Torreon, its other factories being at Saltillo, Ocampo, Gomez Palacio, and La Grunidora. It had at that time acquired great tracts of guayule-producing land. The Madero family were the principal owners of the Compañía Explotadora Coahuilense, S. A., with headquarters at Parras, Coahuila, and other plants at Las Delicias, Cuartros Cienegas, and Vanegas. They also owned or controlled great tracts of shrub-producing land. The third largest interest was the Compañía Explotadora de Caucho Mexicana, with factories at Saltillo and Jimulco. There were also ten or a dozen other smaller concerns. From 1910 the production increased to a remarkable extent, though the revolutions of recent years in Mexico interfered seriously with the industry.

ORIGIN OF THE NAME.

The name guayule, guayhule, or huayule, comes from the Spanish *hay* and Indian *hule*, or "rubber yielder." In Durango, it is called *yerba de hule;* and in San Luis Potosi is called *yule;* also called *jiguhite* near Saltillo, and sometimes *copaline.*[1] Prampolini calls it *yerba del negro* or *mariola*, by which last name it is widely known, though *mariola* rightly means a kindred species (*Parthenium incanum* H. B. K.).

Dr. Seler, of Berlin, however, questions Endlich's idea that guayule=*hay* (has or there is) and *hule* (rubber); *hayhule*= rubber bearer. Seler says it is from two Indian words, *quauh* (wood, tree, or forest) and *olli* (rubber), thus *guauholli*=

[1] "The Economic Importance of Guayule" by Dr. Rudolph Endlich, "Der Tropenpflanzer," May, 1905, p. 233.

wood rubber. (Der Tropen-flanzer, Sept., 1905, p. 540.) This view has the support of Professor Francis E. Lloyd,[2] who believes in its Aztec origin.

DESCRIPTION OF THE GUAYULE SHRUB.

The *Parthenium argentatum* Gray, is the only present rubber

GATHERING THE PLANTS.

producer found among the composites. It is a woody shrub of spreading habit, naturally growing much branched. If the branches die away at the base, a distinctly treelike form is assumed. Large plants may acquire a spread or height of 3 feet or more, but such individuals are of advanced age, probably not less than 40 or 50 years old. The small leaves are greenish, silvery gray, as also are the younger twigs, which, as the age of the axis advances, change to light and then to dark ashy gray. The winter appearance of the plant is strikingly different from the summer appearance. In the winter the leaves, save those forming small clusters at the tips of the twigs, have fallen, leaving these bare. In summer the new growths are clothed with leaves of maximum size in which the green color is more apparent. At this time the flowers are borne in loose clusters on slender stems and crown the plant with a profusion of small yellow blossoms. These are arranged in heads, each head resembling a small daisy and capable of forming at most five seeds. Usually some of these do not develop. A curious manner of development results in the association with the seed of a large amount of chaff.

A plant that is not a rubber producer, the mariola (*Parthenium incanum* H. B. K.), grows often side by side with the *argentatum* and is mistaken for it. To prevent confusion, Dr.

LOADING WAGON WITH GUAYULE.

A. Stapf prepared the following comparison:

Parthenium Argentatum.

A small shrub with a short stem and very numerous, much divided branches, from less than 1 foot to over 3 feet high; woody persistent branches, short, more or less gnarled, covered with a rather smooth, dark gray bark, young shoots silvery gray all over.

Leaves lanceolate, acute, entire, or more often with 1 to 8 coarse acute teeth or lobes, ½ inch long, 2 to 6 inches wide, densely covered with a fine silvery gray tomentum, gradually narrowed into an open long and slender petiole.

Flower heads subsessile, subglobose, 2 lines in diameter, 3 to 7 in a cluster; clusters at the ends of 2 or 3, rarely more; slender branches, collected into a very imperfect corymb, rarely solitary.

Involucre silky pubescent; outer bracts broadly herbaceous on the back.

Parthenium Incanum.

A small shrub 1 to 2 feet high, much branched; woody persistent branches, elongate, slender, covered with a somewhat rough bark, cracking longitudinally, young shoots finely whitish or grayish wooly.

Leaves obovate to obovate-oblong in outline, crenate (the smaller) to deeply pinnatilobed, ½ to 1 inch long (rarely more), ½ to ¾ inch wide, lobes 1 to 2 on each side, entire or the terminal crenate, all very obtuse, the whole leaf densely covered with a white, wooly tomentum when young, then grayish; petiole very short.

Flower heads shortly peduncled, or subsessile, 2 lines in diameter in terminal, often much branched corymbs 1 to 4 inches in diameter, branches slender.

Involucre finely villous; outer bracts slightly herbaceous on the back, above the middle.

Quite recently another species, discovered by Professor F. E. Lloyd, has been named *Parthenium Lloydii*. Professor H. H. Bartlett thus describes the new species, emphasizing the differences between it and the *Parthenium argentatum* as follows:

In the *Parthenium argentatum* the monopodial growth of the seedling is terminated by the development of the first inflorescences. Extension of the stem system takes place at the base of the well-differentiated peduncle, by the growth at that point of two or three branches, whose growth is in turn terminated by inflorescences. As a result of this sharp delimitation of leafy stem and peduncle, the branching of old plants is closely and repeatedly

A GUAYULE BALING PRESS.

divaricate. Grown plants are often finely symmetrical. In *Parthenium Lloydii* the branching is like that of the mariola (*P. incanum*). The stem is more slender than *P. argentatum*, and the leafy penduncle is not sharply delimited.

Well up toward the inflorescence it bears short, leafy spurs which elongate after the closing of the flowering season. A grown plant of the *P. Lloydii* is therefore characterized by intricate interweaving of branches. In herbarium specimens the striking difference between the two specimens lies in the form of the leaves, which in *P. argentatum* are relatively only half as wide as in *P. Lloydii* and rather deeply lacinate, whereas in *P. Lloydii* they are typically sparsely dentate or denticulate.

In the type material of *P. Lloydii* the pappus awns are slightly incurved toward the base, but diverge at the apex. In most material of *P. argentatum* the awns curve away from one another at the base and are somewhat incurved at the apex. This distinction pointed out by Professor Lloyd does not seem to hold throughout the large series of specimens of *P. argentatum* in the Gray and the National Herbaria, but in view of McCallum's recent report that the guayule consists of as many as 125 segregable elementary species, the occasional inapplicability of this character is not to be wondered at. The curvature of the pappus may serve to distinguish *P. Lloydii* from certain segregates, but not from others.

RUBBER CONTENT.

Guayule is distinct from most other rubber-producing plants in that its bark contains no latex, rubber being in the cellular tissue of the epidermis and to a small extent in the branches and leaves, the blossoms being without traces of rubber. The amount of rubber in the topmost branches is very slight, but increases toward the roots. The bark also contains resins and essential oils, which decrease the value of the rubber. Fairly dry plants subdivide into the following weights:

[2] "Guayule, a Rubber Plant of the Chihuahuan Desert," by Francis E. Lloyd, p. 5.

	Per cent.
Wood	47.0
Bark	44.5
Leaves	8.5

BALE OF GUAYULE SHRUB.

According to Whittlesey (1905, p. 5), guayule plants contain rubber as follows:

	Per cent.
Trunk bark	21.4
Root bark	19.5
Branches and leaves	9.7
Trunk wood	Nil.
Root wood	1.7

The yield of marketable rubber from the wild plants varies according to the condition of the plants and the process of extraction employed. The extraction runs from 6 per cent for experiments with average Texas guayule to 15 per cent for some of the highest grade of Mexican, a fair average yield equaling 12 per cent of the weight of the moderately dry plant.

(To be continued.)

GUAYULE BALES IN FACTORY YARD.

PROSPECTS OF RUBBER PRODUCTION IN QUEENSLAND.

UNDER the title "Neglected Industries," the "Queensland Agricultural Journal" for August, 1918, announces that Pará, Ceara, and other rubber-producing trees thrive luxuriantly in tropical Queensland, but that capitalists, when they are asked why they invest no money in rubber plantations in that country, inquire: "How can Queensland, where wages are high and where strikes threaten at critical moments, try to compete with countries where there is an abundance of colored native workers, where wages are low and where land can be leased at low rent, such as British New Guinea?"

At first glance that settles the whole matter, but on closer examination we find that rubber planting is just as profitable in Queensland under labor conditions suitable to white people as it is in a country where colored workers are used. Without going into details, the estimated cost of a rubber plantation in Queensland, comprising 500 acres bearing 75,000 trees, including wages, buildings and equipment, is £34,000. These trees should be ready for tapping after six years, and in the first year of tapping would bring in £15,000; the debit of £19,000 should be changed in the seventh year by a £30,000 crop into a profit of £11,000 above the cost of the plantation; the profit for the eighth year and every year after that should be £45,000 a year.

But even on a smaller scale the business pays. In New Queensland on the east and west coast of the peninsula, land is chiefly planted with sugar, as the climate and rainfall leave nothing to be wished for. The profit and loss account of 20 acres of rubber is as follows: the price of cleared land is £20 an acre; the total cost of exploitation for the first five years is £432. After six years the tapping can begin, each tree giving one pound of dry rubber, the seventh year two pounds, the third year three pounds, and so on, so that in the first three years of tapping, 18,000 pounds of rubber will be obtained, which, at three shillings a pound, means £2,700, from which the cost of collecting the rubber—one shilling per pound or £900 for the crops, including cases and freight—must be deducted.

Many plantations in Queensland are surrounded by forests and shrubs which offer a danger of fire. These could be removed and replaced by rubber trees, so that the profits may be continually increased.

RUBBER PRODUCTION ON HAINAN ISLAND.

The report of the commissioner of customs of the port of Kiungchow, Hainan—an island belonging to China, between latitude 18° and 20° N., deals with the increased production of rubber in that territory. It sums up the situation as follows:

At present the industry is chiefly undertaken by returned emigrants from the Malay States. Since 1910 the Kiung An Co. has planted 6,000 rubber trees in the Kachek district, and the Ch'iao Hsing Co. 45,000 trees in the Nodoa district. The latter company has not yet begun tapping its trees. Two years ago the Kiung An Co. tapped 2,000 trees and this year the number was 3,000, from which 14 pounds was produced daily.

Rubber to the amount of 3,066 pounds was exported to Singapore during the year, either direct or through Hongkong and Bangkok. Export is made in sheets averaging 16 inches long, 10 inches wide and ¼-inch thick. Prices on the last shipment reached only $48 per picul (133-1/3 pounds as against $100 per picul on the first consignment sent to Singapore, said to be first-quality.

Some months ago Lin I-shun, a Cantonese merchant in Singapore, obtained from the Ministry of Agriculture and Commerce a grant of 100,000 acres of land on which to grow 5,000,000 rubber trees, in return for which he guarantees to pay a royalty of $5,000,000 to the Government when the trees have reached a flourishing condition. In December Mr. Lin sent three men to the island to look for suitable areas for planting rubber. A large part of the entire island is said to be suitable for rubber growing.

Gas Defense Equipment and the Rubber Industry.

By Major C. R. Johnson, Chemical Warfare Service, United States Army.

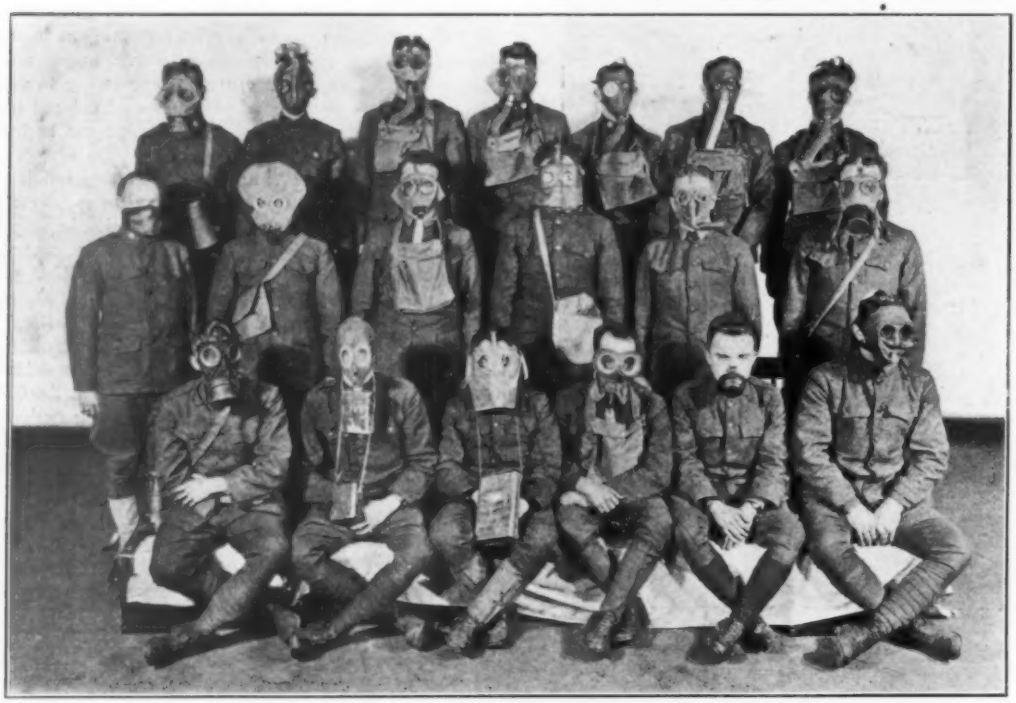


FIG. 1.—TYPES OF GAS MASKS USED BY AMERICAN, ALLIED, AND GERMAN ARMIES.

Sitting, left to right—1. German gas mask. 2. Russian gas mask. 3. Italian gas mask. 4. British mask for motor truck drivers. 5. British airplane respirator. 6. Experimental mask with metal face-piece. Designed by Major Connel, of Medical Corps, American Army.

Middle Row—7. First emergency method put into practice after initial gas attack in April, 1915. Colonel Goodwin, of Medical Department, British Army, devised this mask. 8. British "P. H." helmet—emergency type first used in summer of 1915. 9. British "box respirator," standard type used by British Army. 10. French M-2 mask, original French type used until spring of 1918. 11. Original French artillery mask designed by Tissot. 12. French "A. R. S." mask, last type used by French Army.

Top Row—13. Original American Navy mask. 14. American Navy mask, final type. 15. American "box respirator," a type used by U. S. Army throughout the war. 16. The improved design developed at Gas Defense plant to simplify manufacture. 17. American A. T. mask, all rubber mask in limited production at end of war. 18. American K. T. mask sewed fabric mask in limited production at end of war. 19. American "Model 1919" mask, improved type ready for production when armistice was signed. This mask embodied the good features of 17 and 18 and was extremely simple to manufacture.

THE WAR DEPARTMENT made heroic demands upon the rubber industry for rubber materials required in gas defense equipment and it is gratifying to be able to state that this industry heroically *met* those requirements. During the period of our participation in the war the rubber industry furnished products to the Gas Defense Division to the value of $12,671,461, comprising the following commodities and quantities:

Commodity.	Quantity.
Face fabric	1,060,000 yards
Band fabric	282,580 yards
Lining fabric	21,170 yards
Impermeable fabric	296,500 yards
Strapping	43,100 yards
Rubberized stockinet	159,600 yards
Nose pads	9,210,000 pieces
Deflectors	645,000 pieces
C. E. hoods	2,317,000 pieces
K. T. hoods	2,448 pieces
A. T. Hoods	364,400 pieces
Flexible hose	7,070,000 pieces
Mouth-pieces	7,550,000 pieces
Flutter valves	8,560,000 pieces
Flutter valves (English type)	850,000 pieces
Diaphragms	12,800,000 pieces
Clarifying tubes	1,120,000 pieces
Chin rests	1,378,000 pieces
Rubber bands	2,500 pounds
Die casting washers	4,000,000 pieces
Lens washers	18,700,000 pieces
Hard rubber castings	700,000 pieces
Rubberized felt	103,700 yards
Elastic tape	14,666,550 yards
Adhesive tape	4,106,300 yards

The purpose of this article is to point out the great importance of rubber in the gas mask, to show the intimate connection of the rubber industry with the development and production of this most necessary equipment, and to furnish some technical information acquired in gas-mask production, which may be of future value to the industry.

It can be stated that rubber was universally used in all types of masks. This is illustrated most effectively in Figure 1 in which every respirator, except the very earliest English emergency type, used rubber in various ways. The Germans

EDITOR'S NOTE.—Before the war, Major Johnson was chief chemist of The Goodyear Tire & Rubber Co., Akron, Ohio. He was commissioned in the Sanitary Corps, National Army, in January, 1918, with rank of captain and was assigned to the Gas Defense Service where he was given the following assignments: rubber part procurement; development of Akron Tissot mask; officer in charge Long Island laboratories; technical director Gas Defense Division, Chemical Warfare Service. In October, 1918, he attended the Interallied Conference on Gas Warfare in Paris.

used less than any other nation (thanks to allied sea power) but were not able to eliminate it entirely. Their earliest masks were made of rubber fabric which was abandoned in favor of oiled leather as soon as the rubber shortage became acute. They substituted cloth-covered spiral springs for elastic webbing and the only rubber used in the greater part of their production was a washer containing very little new rubber, to make a gas-tight joint between the canister and the mask. It is interesting to note in connection with this group that the Russian mask contained more rubber than any of the others, as it had a complete hood covering. The final English, all French, and all American masks used rubberized fabric of some form, either unreinforced or united to close-woven cloth or stockinet.

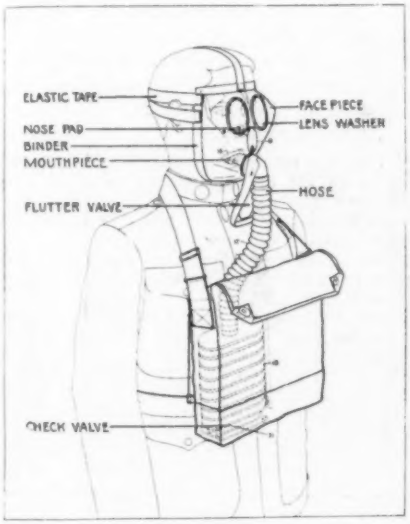


FIG. 2.—AMERICAN BOX RESPIRATOR, C. E. TYPE, SHOWING RUBBER PARTS.

OPERATION OF THE AMERICAN RESPIRATOR.

An outline drawing of the American box respirator furnished to our troops is shown in Figure 2 and in order that the reader may understand more clearly the various matters discussed later it will not be out of place to describe briefly the manner in which the respirator functions. Upon inhalation, the air passes into the bottom of the canister 18, through rubber diaphragm check valve 31, up through absorbent chemicals and mechanical filters into flexible rubber hose 17, through the face-piece by way of an aluminum die casting and into the mouth of the wearer through a rubber mouth-piece 16, which is worn between the lips and the teeth. At the same time any passage of air through the nose is stopped by a spring and rubber nose clip 8, and 9. Upon exhalation the air passes out through the same mouth-piece through another passage in the die casting and finally to the outside air through the rubber exhalation or flutter valve 14.

It is evident that in a device of this kind the lungs are protected by the closure of the nose and the direct connection of the mouth-piece. However, since the Germans used gases which immediately closed the eyes and even led to temporary blindness it was essential that the face-piece should provide a tight fit with the face and that the rubberized cloth in the face-piece prevent the entrance of gas by permeation. Gas-tightness of the eye-piece was insured by a rubber gasket and the various points were made gas-tight by use of wire, adhesive tape, and rubber cement.

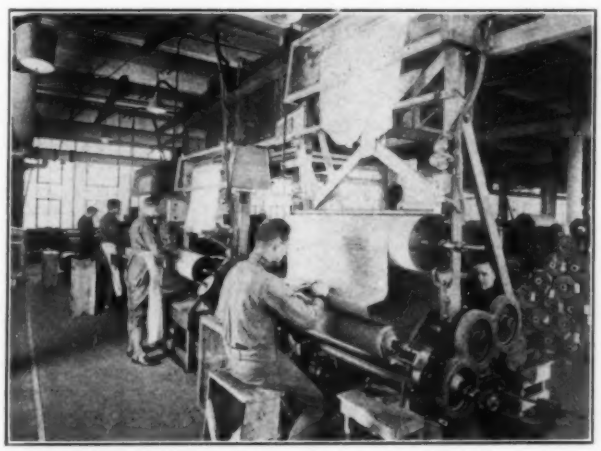


FIG. 4.—ELECTRICAL RUBBER FABRIC TESTING MACHINES.

THE FIRST 25,000 MASKS.

When the United States went into the war practically nothing was known of gas warfare. In fact, very soon after the first use of gas in April, 1915, by the Germans, the Allies adopted a policy of strict secrecy in order that their offensive and defensive plans might be more effective.

FIG. 3.—AMERICAN BOX RESPIRATOR, C. E. TYPE.

It can be easily appreciated that the Bureau of Mines faced a difficult task when it was requested by the War Department on May 16, 1917, to furnish 25,000 respirators in three weeks. The Director of the Bureau, Van H. Manning, had realized the ugly possibilities of gas warfare and had organized a bureau under the direction of G. A. Burrell for the purpose of gas investigations. Mr. Burrell called upon Bradley Dewey[1], a Pittsburgh chemical engineer, to take charge of the production of the first 25,000 masks.

It was recognized that a delivery could not possibly be made in three weeks' time, an impossibility, even if a settled design had existed. Contracts were placed with The B. F. Goodrich Co., Akron, Ohio, for furnishing complete face-pieces and with the American Can Co., New York, for the canister and final assembly. Only those actually connected with the enterprise at the time would appreciate the intense effort required of all to make this delivery by the end of June, which was done. While the masks resulting from this early effort were not adequate when they reached the front, because of new gases introduced in the interim, nevertheless they were adequate to meet conditions in mind when they were made and a credit to all concerned.

RUBBER MANUFACTURERS COOPERATE.

The memorandum of May 16, 1917, from the Chief of Staff called for completion of

[1] Mr. Dewey was commissioned in July, 1917, a major in the Sanitary Corps of the Medical Department and made responsible for the production of gas defense equipment. In July, 1918, this activity with all others involved in the gas warfare was consolidated by an order of the President into the Chemical Warfare Service, United States Army, and Major-General William S. Sibert placed in charge. Gas Defense production was made a division of this service under Colonel Bradley Dewey and grew in its schedules and activities until, on November 11, 1918, it had throughout the country, 80 organized detachments and a personnel of 274 officers, 2,353 enlisted men and 13,000 civilians.

1,100,000 respirators by June 30, 1918. In July arrangements were made with The B. F. Goodrich Co., The Goodyear Tire & Rubber Co., and the United States Rubber Co. to supply 320,000 complete face-pieces ready for assembly, and the same quantity of other rubber parts including flexible hose, flutter valves,

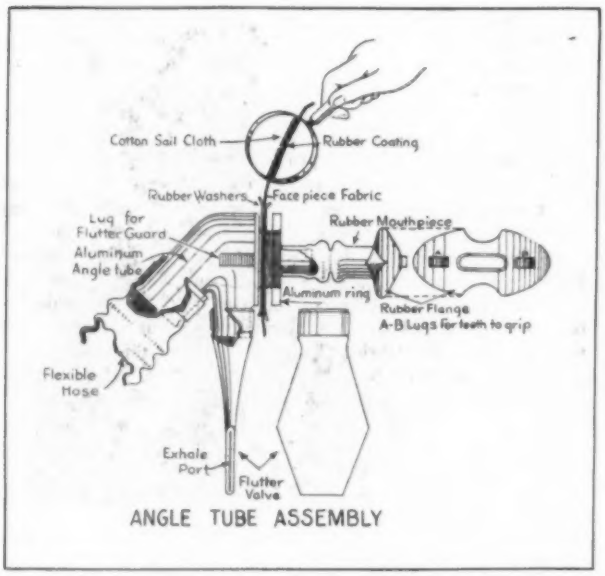


FIG. 5.—TUBE ASSEMBLY SHOWING RUBBER MOUTH-PIECE, FLUTTER VALVE AND FLEXIBLE HOSE.

mouth-pieces, rubber diaphragm check valves and rubber washers for the die-casting assembly. The B. F. Goodrich Co. showed a very fine cooperative spirit in assisting the other two companies to bid intelligently by giving them the benefit of its previous mask-making experience which included not only the Army order for 25,000 but also a Navy order. Without this assistance the other two companies would have been reluctant to bid on a proposition which was not worked out in complete design and specification. This marked the beginning of the cooperation which continued between these companies on all matters pertaining to gas masks. This spirit of cooperation was universally evident among the various rubber companies who later supplied material. It is not going too far to say, based on gas-mask experience, that such cooperation carried into all lines would not only benefit all participating but would advance the industry. After all, no company has a monopoly on good ideas.

The months of July, August, September, and October, 1917, were consumed in getting various mold equipment and in devising methods of manufacturing. During this period, and in fact until the end of the year, questions of design and specifications were in a state of flux, partly because the Gas Defense Service required time to determine various important details of design and partly because one company after another would find an improvement in method or design which would be of such advantage that its adoption by all was desirable. Again, the Gas Defense Service had realized the importance of the highest perfection necessary in a respirator and consequently insisted on high standards of deliveries. The manufacturers, on the other hand, without detailed and sufficient specifications, with frequent changes coming through, with a vivid impression of the need of rapid action, and not as clear a vision of the need of extreme perfection, made deliveries of masks and parts which necessitated high rejections at the assembly plant. It was a most trying period and only the real desire on the part of all involved to see that our soldiers had good gas masks, kept the various elements together through this time.

RUBBER MANUFACTURING COMMITTEE FORMED.

In November, Colonel Dewey, at the suggestion of the rubber manufacturers, organized a rubber manufacturing committee, composed of Dr. W. C. Geer, of The B. F. Goodrich Co., chairman, Dr. T. H. Whittelsey, of the United States Rubber Co., and C. R. Johnson, of The Goodyear Tire & Rubber Co. This was done with the realization that the rubber companies should be in necessary touch with gas defense problems and that they could render considerable aid in the preparation of specifications. A quotation of the minutes of the first meeting indicates the spirit with which the committee worked.

(a) It is decided that the committee itself should help the Gas Defense Service in so far as research, development and specification problems are concerned. The problems of production volume, production distribution, relationships of personnel, etc., are to be divorced from the work of this committee.

(b) It is agreed that where new ideas are developed which may have value to other parts of the rubber industry, preliminary tests of both the raw and fabricated product shall be conducted without a full disclosure of the exact nature of the process by which the articles are made. It is, however, definitely agreed that whenever the Gas Defense Service feels that the tests in themselves show that the product is needed and should be used on soldiers in the field, the whole committee shall then be given every single detail of design, composition, and methods of manufacture in so far as it is possible to describe such details without the use of detailed dimension drawings or photographs.

(c) It is agreed that no member of the committee commit himself to the policy of inviting other rubber interests into his factory.

(d) The Gas Defense Service agrees that in the future, it will wherever possible before making any changes in specification or in methods of inspection, submit an outline of the changes to this committee for its comment. Furthermore, it agrees that in so far as possible it will see that the committee is kept informed regarding the less confidential features of gas warfare.

This committee prepared in frequent conference the complete specifications of the rubber materials used in gas masks and carried on by means of the available laboratory facilities many development and research problems the solution of which was urgently needed by the Gas Defense Service.

Early in January the writer entered the Gas Defense Service and was replaced on the committee by William Stephens, of The Goodyear Tire and Rubber Co. This committee was at that time officially recognized by The Rubber Association of America as its representative on gas defense matters. It continued to give

FIG. 6.—FLUTTER VALVE INSPECTION.

valuable service during the period of the war. It was enlarged in personnel in September, 1918, as follows: Dr. W. C. Geer, chairman, The B. F. Goodrich Co.; Dr. Theodore Whittelsey, United States Rubber Co.; William Stephens, The Goodyear Tire & Rubber Co.; T. W. Miller, The Faultless Rubber Co.; L. C.

Himebaugh, British-American Manufacturing Co.; George A. Luddington, The Fisk Rubber Co.; George A. Daum, Pennsylvania Rubber Co.

The closer contact resulting from the Rubber Committee was

FIG 7.—FLUTTER VALVE LEAKAGE-TESTING APPARATUS.

evidenced by a better appreciation on the part of the manufacturers of gas defense needs and this was reflected in better deliveries of rubber parts. By February, production had reached a firm basis and in the three succeeding months the quality of production was improved to such an extent that rejections at the assembly plant were reduced to a very low percentage.

RUBBERIZED FABRIC EXTENSIVELY USED.

Rubberized fabrics were extensively used in mask manufacture and upwards of 1,500,000 yards were made. In the early days many difficulties were encountered and specifications were changed several times before a satisfactory gas-proof fabric was obtained.

At first a No. 4 sail-cloth coated on one side with rubber was used. The amount of rubber was insufficient and many masks were unsuitable on account of light spots and even pinholes. To overcome this, more rubber was used and both sides of the fabric were coated. With one ounce per square yard of rubber on the outside, 3.6-ounce sail-cloth and 4-ounce rubber on the inside, there was a total weight of 8.6-ounces per square yard. This, however, still resulted in light spots which were a cause of concern to the Service. At the same time it was reported from abroad that the Germans were using a new tear-producing gas, chloropicrin, which had great power in penetrating rubber and consequently with thinly coated fabrics might soon put soldiers out of action. Steps were therefore taken to increase the rubber coating and by compounding research to find a combination, if possible, which would better resist the gas. Hundreds of compounds were produced and tested and it was found that paraffine in small quantities incorporated in the rubber was most useful in increasing resistance.

FABRIC TESTING METHODS AND APPARATUS.

The method of testing employed at first consisted of putting a thin glass-sealed capsule of the poison liquid (chloropicrin, boiling point, 122 degrees C.) in a wide-mouthed 250-cc. bottle, covering the mouth of the bottle with one layer of the fabric to be tested, breaking the capsule and noting the time for the gas to make itself evident to the eye or nose. This method was unsatisfactory for two reasons—difference in sensibility of the observers, and marked effect of temperature on the rate of permeability. This method was replaced by one worked out by the Bureau of Mines which gave much more consistent results.

The apparatus consisted of a silvered, two-part drum in the lower half of which was placed the liquid chloropicrin, the fabric to be tested acting as a diaphragm between the upper and lower halves, the upper half being provided with an arrangement for sweeping air over the upper surface of the fabric. The air was swept out through hot tubes which served to break down any chloropicrin to chlorine as soon as it came through. This end point was made evident by the use of starch iodide solution. While this apparatus provided an accurate end point and temperature control of the chloropicrin, it did not provide for temperature control of the incoming air and, therefore, the temperature of the fabric. The importance of this was not realized until summer when the permeability number of given fabric specifications went down markedly. The apparatus was finally modified by the Gas Defense Division to provide ample thermostatic control of liquid and fabric and thoroughly consistent results were then obtained.

The early requirements for fabric to test 8 minutes against chloropicrin were soon raised to 17 minutes. At this period it seemed likely that fabric with resistance of one hour might be demanded at any moment by the use on the part of the Germans of even more penetrating gas. It was recognized that this requirement could be met by increasing the amount of rubber coat, but this plan suffered two drawbacks—one, a too great increase in thickness and stiffness of the cloth, and the other, the requirement of too long a time for aeration. This latter term may be explained by the fact that permeation of rubber by these gases was a solubility phenomenon, layer by layer, through the rubber film. A thicker rubber which required one hour for the gas to penetrate required a correspondingly long time for the gas absorbed in the rubber to dissipate by evaporation. As a practical result, the soldier might be protected against a gas attack, put his mask away in his knapsack and later, when

FIG. 8.—FINAL ASSEMBLY OF R. F. K. TYPE MASKS.

wearing his mask, actually suffer a gas attack from the mask itself as the gas evaporated from it.

THE DEVELOPMENT OF FABRIC SPECIFICATIONS.

It was at this time, therefore, that the greatest amount of research work on fabric was performed by the three rubber companies who were making masks. As an outgrowth of this

work several specifications were developed providing protection up to 48 hours against the standard test which was in itself much more severe than field conditions. None of these fabrics was ever used, as the development of gas warfare did not demand it. They did, however, represent a reserve for any future developments, thus giving rise to an increase in confidence. These fabrics were, as a rule, made up of rubber but depended for their impermeability upon a film of different material.

The final specification used comprised of a No. 4 sail dyed olive drab and coated on one side with rubber to a total weight of 17 ounces. A lighter 11-ounce fabric was used for facing the band of the mask on account of its greater adaptability for yielding a mask with no wrinkles in contact with the face.

There were two types of compounds used and authorized by the Service, for the reason that various producing companies found them more adaptable. One based upon formulas obtained from the English carried approximately 60 per cent rubber and the balance inorganic filters chiefly composed of China clay and litharge. A small amount of mineral rubber and brown substitute was used. The latter was eliminated later. This compound lent itself very satisfactorily to the use of dry-heat cure.

The other compound, higher in rubber (84 per cent), and the balance inorganic filler, gave better resistance to gas penetration. It was not found as suitable for the dry-heat cure, however, as the rubber lost much of its life, but to the steam cure this type responded very satisfactorily.

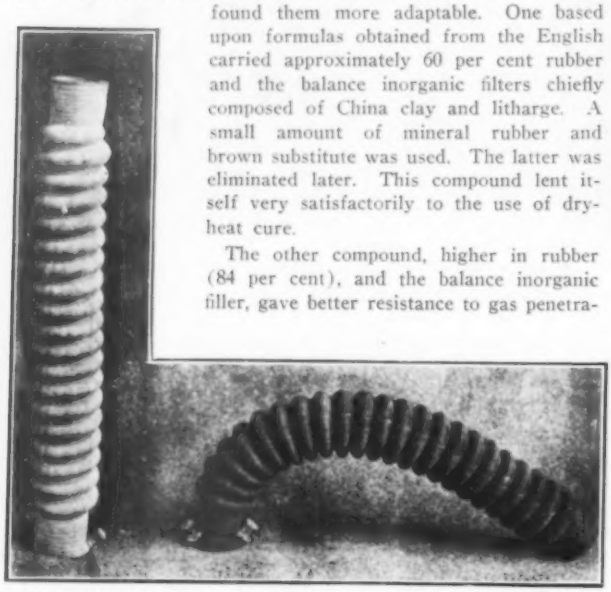


FIG. 9.—FLEXIBLE HOSE AND FLEXIBILITY TEST. NEW DESIGN AT RIGHT.

RIGID FABRIC INSPECTION REQUIRED.

The early days of fabric manufacture were troublesome times for both the manufacturers and the Gas Defense Service. In the first place only the highest standards prevailed in the minds of the Army representatives and yet in the early days it was not possible to reduce this high ideal to an inspection basis which really eliminated vital defects while allowing those of no consequence to pass. This resulted in the rejection of much material which might have been used, as shown by later experience. Many meetings were held to discuss when a defect was not a defect, etc., without bringing the two interests any closer together. The question of rough spots, the importance of foreign material at the surface and embedded in the fabric, the border lines of pits or depressions, the tremendous effect upon the rubber film of knots and slugs in the cloth itself, all constituted a basis of real difference of opinion which was a matter of great concern.

Type samples of all kinds of defects representing rejects, border cases, and accepts were finally agreed upon and the basis of inspection reached was a visual inspection of each roll, yard by yard, and a tally of defects. If the number of defects did not permit the plant to get 85 per cent perfect blanks when the roll was cut, the roll was rejected. The manufacturer then had the choice of taking the roll back or having it cut at his risk with payment arranged upon a pro rata of acceptable blanks to the whole.

ELECTRICAL RUBBER FABRIC TESTING MACHINE.

While this method did smooth out the problem, the Gas Defense plant (a government-operated assembly plant located at Long Island City) recognized that many hidden defects might get by even the most rigid visual inspection and in turn visual inspection involved the never-constant human element. The plant therefore set about to eliminate this type of inspection and evolved the high-voltage electrical testing machine shown in Figure 4, which was entirely satisfactory. In this machine the fabric was passed between steel rolls which had an electrical potential difference of 4,000 volts. Any hidden hole, thin spots, pit, or embedded metal was broken down; the current arced through and burned a little circle which was its own rejection mark.

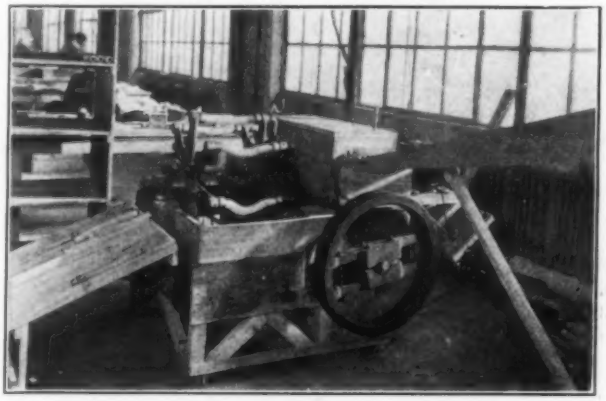


FIG. 10.—PRESSURE LEAKAGE TESTING MACHINE FOR FLEXIBLE HOSE.

FABRIC MANUFACTURERS COOPERATE.

Mention has been made of the fact that knots and slugs in the cloth itself were a cause of trouble. This was true because they became embedded in the rubber and made a thin spot in the film. The early days witnessed strenuous effort to improve the cloth used in gas masks. While a very fine cloth had been produced in this country for balloon work, no great

FIG. 11.—AUTOMATIC MACHINE FOR CUTTING ELASTIC HARNESS TAPE.

capacity was available and balloons and airplanes themselves were demanding enormous yardage to meet the wartime program. It was therefore necessary to work cooperatively with various cloth manufacturers in order that they might produce cloth to Gas Defense standards.

FIG. 12.—AMERICAN A. T. RESPIRATOR.

The problem involved more careful methods of yarn preparation, spinning, and the equipment of many hundreds of looms with automatic stop motions in connection with warp breakage. One manufacturer went so far as to start a spinning frame full-spooled and running through to the end, shutting down as the first spool ran out, and replacing throughout with new full spools. Thus the tied ends were eliminated. The less expensive method usually employed is to replace the spool and tie in a new end as each one runs out. This made by far the best fabric.

The No. 4 sail-cloth had a count of 110 in the warp and 116 in the fill, and a breaking strength of 50 pounds warp and fill in a one-inch strip.

EXHALATION OR FLUTTER VALVE.

This valve, see Figure 5, had to fulfil one of the most important requirements of all the parts of the respirator. It was necessary that it should allow the escape of exhaled air without too much resistance, and yet close instantly upon inspiration. It was required to show not over one inch of resistance at 120 liters per minute exhalation and a leakage of not over 10 cc. per minute when dry and at a pressure difference of one inch of water. In use, the valve became immediately wet with saliva which reduced its leakage to zero.

As originally made, the valve was wider and had a neck formed to fit the metal connection. Extensive experimentation revealed the fact that it was better to make the valve flat and narrower. When the flat neck was fitted to the oval connection, slight stresses were set up which tended to close the ports more tightly. The flutter valve was a source of great trouble for the manufacturers. The requirements were severe. Aside from the leakage test the valve was examined very carefully for holes, foreign material, gaping ports and dimensions. A part of this examination consisted in placing a rounded brass knob inside the valve, sliding and stretching the valve over the knob to bring to light any breaks, pits, or foreign material. This examination also showed any weak seams and edges. Seam construction gave a great amount of early trouble, which was finally overcome by careful handling and adjustment of stocks. This valve had one weakness inherent in the design, which was not overcome during the whole experience. This was a weak edge where the two halves were joined at the sides. The weak edge resulted from the fold at this point and pressure during cure with a consequent loss in grain. It was undesirable because, when the valve was mounted, the solvent in the cement attacked the weakened tissue and often broke through.

FIG. 13.—INTERIOR OF A. T. FACE-PIECE, SHOWING CLARIFYING TUBE AND CHIN REST.

The method of manufacture usually employed was to die out of sheet stock in single or double piece and then by making one or two seams and a fold, the make-up was ready for cure. Curing was done in soapstone or with slight pressure from plates. After cure, the valves were trimmed at neck and ports to dimensions. Specifications required not less than 85 per cent upriver fine Pará rubber, the remainder being sulphur and dry inorganic fillers. The use of organic accelerators was permitted upon application of manufacturers and upon evidence of satisfactory delivery. Large rejections took place at the manufacturing and assembly plants, and while constant effort was made to reduce rejections and much progress was made, yet the manufacturer was always obliged to reject many valves. To illustrate, there was an accepted delivery from all sources of 8,500,000 valves and it is estimated that 15,000,000 were made to yield this delivery.

Numerous attempts were made to replace this valve and many unique and interesting samples were submitted. All of them lacked some property which the standard valve possessed. One of the most promising was submitted by Dr. Geer of The B. F. Goodrich Co. and was made up of two molded rubber parts and a cylindrical metal housing. One was a bell-shaped rubber piece joined to the housing and leading to the mask; the other, a nearly flat flange which rested against the bell-shaped part. This flange was mounted upon the base of the housing and contracted and expanded into a bellows, thus furnishing a delicate spring action to provide closure. The frame served to mount the two rubber parts, to protect them from damage, and to provide adjustment. The especially desirable features of this valve were its compactness and very low resistance to exhalation, about one-quarter of that of the standard valve. There was not time after the valve had been perfected in design, to determine its durability and dependability

FIG. 14.—GAS CHAMBER FOR TESTING MASKS.

in the field before the signing of the armistice was announced.

FLEXIBLE HOSE.

The flexible hose, shown in figure 9, was used to connect the canister to the facepiece. It was originally made of 3/32-gage

FIG. 15.—ALUMINUM A. T. MASK FORMS. TWO CURING FORMS AT LEFT. BUILDING FORM AT RIGHT.

rubber with spiral corrugations and covered with 5-ounce stockinet. It was made by placing tubed stock on a spiral corrugated mandrel, covering with stockinet, and wrapping with a cord. The make-ups were mounted upon racks and cured in open steam. This method yielded a product that was unsatisfactory from several standpoints. Rejections were high on account of interior folds or buckles and poor adhesion. The hose was not flexible enough. The English had used circular instead of spiral corrugations, and had secured greater flexibility. The early manufacturers tried several methods to make this hose and finally a molded method worked out by E. L. Stimson of the Mechanical Rubber Co., Cleveland, Ohio, was adopted. It consisted of a semi-cured rubber part which was covered with rubber-coated or cemented stockinet and then given a final cure to produce the necessary adhesion. First-cure and second-cure molds were therefore required and mandrels had to remain with their cavity. This process with the later use of stockinet knitted in a tube of proper size, was standard throughout the manufacture of the hose. Individual manufacturers worked out many clever labor-saving methods of applying stockinet, trimming ends, etc.

Many early troubles were encountered in the manufacture of hose involving correct corrugation design to produce flexibility, proper registration of molds and mandrels, pinching in final cure, and adhesion of stockinet. The hose was tested under water with five pounds' air pressure (Figure 10) and had to pass a flexibility test (Figure 9). The fabric adhesion on a two-corrugation section had to be at least four pounds at one inch per minute separation. It was necessary that the hose should not kink when bent double on thumb and forefinger.

MOUTH-PIECE.

The rubber mouth-piece (Figure 5) had to be designed to be as comfortable as possible in the mouth, to cause the minimum amount of salivation and to be tough enough to resist biting and chewing. Several improvements were made in the earlier design, involving a decrease in the flange which went between the lips and gums and the introduction of two corrugations in the neck to make greater flexibility and consequently less irritation to the mouth when running or walking.

The compound was similar to tread compound and called for 35 per cent plantation rubber and the balance sulphur and inorganic filler. The gravity was placed so high that it was necessary to make most of the balance of zinc oxide. No organic accelerator was permitted on account of the use of the mouthpiece.

Little difficulty was encountered in manufacture, once requirements were appreciated and mold equipment lined up and watched. It was necessary to use the same mandrel in the same cavity each time to insure even wall thickness. Greater smoothness was obtained by tumbling.

NOSE PAD.

This was a small molded button provided with corrugations for fastening to the wire nose clip, and with concentric rings molded into the surface to come in contact with the nose in order to make the clip stay in place. The part contracted at the middle to a small diameter neck. This provided easy motion of the face of the pad to accommodate noses of different shapes. Two were furnished for each mask. The manufacture of this article was no different from that of any simple molded article.

DIAPHRAGM VALVE.

The diaphragm valve is a thin rubber disk designed to rest on a metal fitting in the bottom of the canister. Its use was to prevent exhaled air from passing out through the canister. This part was molded and little trouble was encountered in its manufacture. Some rejections were necessary on account of warpage and poor packing.

Eye-piece washers were made by the usual jar-ring processes, but a better composition was required. Thirty-five per cent plantation rubber was used, the remainder consisting of sulphur and dry inorganic fillers.

ELASTIC TAPE.

Elastic tape was used in enormous quantities for the head harness. Little trouble was encountered in the manufacture, but numerous changes in specifications were made necessary by changing conditions of gas warfare. At first it was necessary to wear the masks only a few minutes at a time. As soon as it became necessary to wear them for a longer period, it was found that the elastic was too strong in tension. This elastic had been made up in one-inch widths and each strand of rubber was protected against aging by a double thread winding. The tension was first reduced by using narrower tape and looser weaving and finally by omitting the winding of the original strands. A great many experiments on many heads revealed the fact that there was a very narrow limit in the stress strain properties of an elastic between comfort on one hand and safety on the other.

FIG. 16.—OXYGEN INHALATOR FOR TREATMENT OF GASSED SOLDIERS.

The purpose of the winding of the strand to protect from aging, caused an investigation of the properties of so-called black elastic thread as against the usual pure gum. All tests served to confirm that the black was more satisfactory, but none was used up to the time of the armistice.

The specifications provided for twelve strands of No. 26 thread with a tension of 18 ounces at 5 per cent stretch and 36 ounces at 40 per cent stretch.

Elastic tape to the amount of 14,666,500 yards was delivered to the Gas Defense Division.

In the quantity handling of elastic tape for harness, an ingenious machine shown in Figure 11 was developed at the Gas

Defense plant which made it possible to cut to any predetermined length 100 lengths at one time. The machine once adjusted was practically automatic in its operation, and only required replacement of the rolls of tape.

THE A. T. RESPIRATOR.

The A. T. respirator mask (Figure 12) was one of the two in the process of manufacture at the time of the armistice. It was suitable for manufacture in rubber factories. The other one, known as the K. T. respirator, was a sewed and cemented face-piece and suitable for manufacture in the Gas Defense plant. They were the same from the standpoint of the user, and both were manufactured to obtain maximum production.

The letters "A. T." are an abbreviation of the name "Akron Tissot." This name was used because the mask made use of a principle first used by a Frenchman named Tissot and the development largely took place at Akron. This mask was designed to meet the rapidly developing requirements of gas warfare. The use of mustard gas by the Germans (this gas often persisted in the ground from one to two weeks and continued to give off toxic concentrations) made necessary long wearing of masks—often ten to twelve hours. This was impossible with the standard mask; at least with many individuals, the discomfort of the nose clip and mouth-piece and the pressure of the face-piece became unbearable.

Mustard gas is most insidious. A man can be exposed to the vapors for twelve hours and hardly be conscious of its presence, with no apparent ill effects, and then, a day or two later, conjunctivitis of the eyes, lung tissue destruction and body burns will develop. As a result of these conditions, many soldiers would not wear their masks a long time in mustard gas or would use only the mouth-piece, and eye trouble developed later.

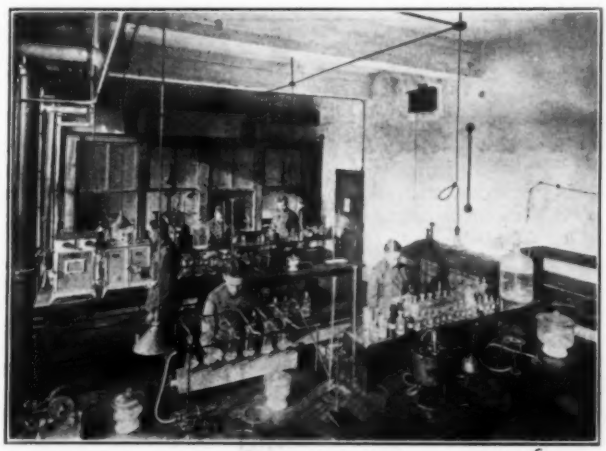


FIG. 17.—ANALYTICAL RUBBER LABORATORY, LONG ISLAND CITY, NEW YORK.

In addition to the above considerations, the vision obtained from the regular mask was not altogether satisfactory. The moisture from the face condensed upon the eye-piece and in spite of anti-dimming compounds (not always used) it was necessary when wearing the mask repeatedly to wipe the inside of the glass, by making use of a pocket in each side of the face-piece. Therefore, the problem of design involved was to achieve much greater face-piece comfort, to eliminate the nose clip and mouth-piece and make better vision possible.

Much preliminary work had been done by the Bureau of Mines along these lines and in April, 1918, a model was turned over to the Gas Defense Service. It was hand-made of sheet rubber, reinforced and protected by stockinet on the outside, provided with harness of pure gum straps and arranged to lead all incoming air against the inside of the eye-pieces before it was breathed by the soldier. This arrangement (the Tissot principle) kept the eye-pieces comparatively free from moisture and with the use of anti-dimming compound, practically perfect vision resulted.

While this model embodied the desirable elements, much development work was necessary before all requirements could be satisfied. Accordingly, arrangements were made in April to carry on this work at the plants of The B. F. Goodrich Co. and The Goodyear Tire & Rubber Co. in Akron.

By July 1, 1918, a model had been developed which eliminated some of the defects of the early designs. These improvements included better vision, better stretch of the stockinet in each direction, less pressure on the forehead, elimination of pressure upon the nose, improvement in harness, and reinforcement of the lower face-piece to prevent collapse when breathing. These improvements were made as a result of tests upon soldiers in gas and upon advice of the American Expeditionary Force, which had been supplied with samples as they were developed. The two rubber companies built splendid gas chambers at their plants and thus afforded immediate facilities for testing. As an indication that this mask more nearly met requirements, a quotation from an American Expeditionary Force cabled report is given: "Six men wore these masks continuously for 29½ hours and took them off only because ordered."

During May and June a production of the earlier model was started in order to have production facilities available when the final design was adopted. The early method of manufacture was to cut the sheet stock to a flat pattern, apply the stockinet, build in semi-cured lens frames, form the seam under the chin, reinforce the edges with gum strips, and cure on an aluminum form in open steam with or without wrapping. This method yielded fairly satisfactory results on the earlier models, but in the final design the amount of contact with the face had been sacrificed to obtain comfort and therefore dimension requirements had to be fulfilled within close limits. The method described did not yield a good product within these limits.

The period of July to October was employed in overcoming manufacturing difficulties which included the following:

1. The procurement of standard dimension curing forms in the necessary sizes. (See Figure 5.)

2. The procurement of lens frame molds which would yield the proper design of semi-cured rubber lens and hold the register and gage.

3. The development of manufacturing methods which would yield a product satisfactory in dimensions.

In connection with No. 1 the pattern makers found it difficult to make proper allowances for shrinkage in making the aluminum curing form. It was necessary to change the source of supply several times.

With respect to No. 3, the rubber industry showed remarkable fertility of ideas and ingenuity of method with regard to methods of manufacture. It would require the space of a whole article in itself to describe the methods involved. Contracts were let to different companies and as many methods were employed The wrapped cure was adopted in one way or another throughout. Some obtained results with one cure and by use of templates and guides attached to the curing form, which confined the flow of stock and located harness tabs. Others used variations of the two-cure process in which trimming was done after semi-cure and correct dimensions thus secured. Ingenious diaphragm and air-bag curing methods were employed and at the time of the armistice the mold mask began to show promise. The Aluminum Company of America worked out aluminum molds by successive casting of wax, plaster of Paris, cast iron, and aluminum. This method, in the opinion of the writer, will have a more general use for various irregular shapes which may be needed by the industry.

Other rubber parts used in the A. T. mask included a clarifying tube, a Y-shaped tube leading from the die casting and delivering air from the canister through its two branches to the eye-pieces.

The chin rest shown in Figure 13 was a molded rubber part composed of a sponge rubber face and a soft rubber back slotted for fastening to the die casting. The surface of the sponge rubber was made smooth in the molding. The soft rubber and sponge were molded separately and cemented together. Production of these two parts was obtained in large quantities with little trouble. Altogether, complete parts were furnished for 364,000 A. T. masks up to the time of the armistice.

THE K. T. TYPE RESPIRATOR.

This mask was developed at the Gas Defense plant to meet the same requirements as outlined in describing the A. T. respirator. It was made up by sewing and cementing stiff fabric and rubberized stockinet to a frame similar to the frame in the old-type masks. It contained many improvements in harness and fit which led to comfort. Air was deflected upon the eye-pieces by a molded rubber shield. Altogether, 338,000 of these were manufactured in the plant up to the armistice, over half of which were suitable for overseas use and the balance for soldiers in the training camps.

A stiff and gas-resisting fabric was needed to give body to the mask which would otherwise collapse against the face with each individual. Experiments were made to develop a stiff and impermeable fabric which was demanded by this type. Several constructions were developed. One involved the use of one ply of enameling duck impregnated with semi-hard rubber joined by cement to a ply of the regular gas-mask fabric. Another used a preliminary stiffening treatment of the duck followed by rubberizing and doubling with the regular fabric. The last named method produced the most satisfactory fabric, giving great elasticity, yet sufficient stiffness for the purpose for which it was intended.

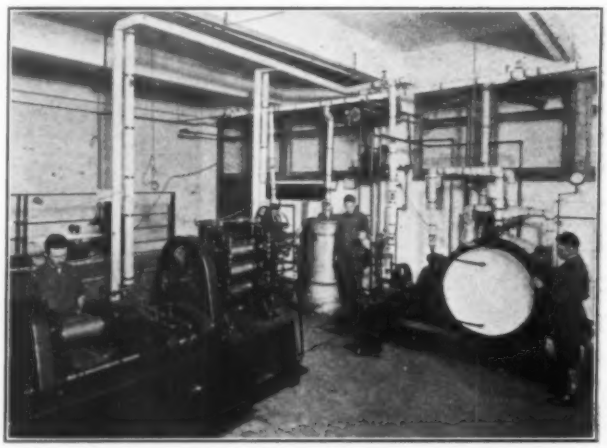


FIG. 18.—RUBBER WORKSHOP, LONG ISLAND LABORATORY, LONG ISLAND CITY, NEW YORK.

HARD RUBBER ANGLE TUBES.

The angle tube (see Figure 5) was ordinarily made of aluminum by the pressure-die-casting method. This process required complicated dies and cores, and in the spring of 1918 it became evident that the capacity available was not going to be sufficient for the needs, and attention was directed to the possibility of hard rubber as a material.

The various hard rubber companies cooperated in the development of this article and, working with the Rubber Committee, developed specifications. The great question to be determined was the degree of hardness desirable and whether or not the threads would stand temperature changes. Tests were made in great numbers in cold storage and in warm weather to decide points in the specification. The merits of various methods of manufacture were discussed in meetings. The consensus of opinion of the Rubber Committee in conference with manufacturers and Gas Defense representatives was that hard rubber as a material was satisfactory for use but not as satisfactory as metal. The 700,000 deliveries of this product justified this conclusion, as much trouble was encountered due to variation in hardness and in dimensions. Some were so soft as not to permit assembly to masks.

Other materials furnished by the rubber industry included zinc-oxide adhesive tape, rubberized felt for the bands of the R. F. K. type mask, strapping for covering sewed seams on the K. T. mask, rubberized stockinet for the K. T. mask, and molded rubber air deflectors for the K. T. type mask. Several thousand oxygen inhalers (Fig. 16), were shipped overseas for use in treatment of gassed soldiers. The rubber parts involved in this equipment included a face mask of metal filled with a pneumatic rubber cushion, a flexible armored rubber hose, and a rubberized fabric breathing bag to regulate pressure.

REGARDING SPECIFICATIONS.

The policy followed by the Gas Defense Division in harmony with the advice of the Rubber Committee was to use only the best materials throughout. Organic accelerators were barred from general use for two reasons: (1) certain parts were in contact with the mouth or face and (2) the use of these accelerators by the trade was new and not fully developed. In the case of the A. T. mask and parts in contact with the face, lead compounds were not permitted. This was due not to the knowledge that lead poisoning could be transmitted in this manner, but to the knowledge that skin irritations were liable to develop in some cases from heat and contact, and it was not considered advisable to have a discussion as to the effect of lead in such cases. This requirement made a difficult compounding problem for the manufacturer, especially since a non-blooming product was desired.

Reclaimed rubber was not permitted in any product. This was not because of failure to realize that reclaims could be used successfully, but because it was considered difficult to write specifications which would amply protect the Government on products which had to be put into use immediately for a vitally important purpose. That the policy followed in writing the specifications was justified, is proved by the results shown by the product. There are no reports which indicate that the rubber goods furnished in our gas masks were unsatisfactory at the start or after use. The writer personally inspected a salvage dump of masks in France, and with one exception, found no evidence of rubber failure from aging. There was, in the case of the flutter valve, which when mounted on the metal fitting was stretched by the bead, a tendency to surface check, but this serves merely to support a well-known fact that rubber, when placed under continued tension, does not age well.

SPECIAL RUBBER LABORATORIES.

Laboratories were established at Akron and at each assembly plant for the purpose of determining the fact of compliance with specifications. In all these laboratories physical tests were made on cured slabs and upon the articles themselves. The Akron laboratory was in charge of an experienced rubber man and cures were checked on all deliveries. The institution not only was of value to the Government but often saved contractors losses on off-cure articles which had not been caught by regular inspection.

At Long Island City a chemical laboratory was equipped to perform chemical analysis of the rubber products. One sample of each article from each manufacturer was analyzed every month. It is gratifying to state that this check revealed no attempt on

the part of the manufacturer to deliver products that were not within the specifications. At the Long Island laboratory there was established an experimental rubber workshop, which furnished immediate service on rubber needs of the Gas Defense Division. It was equipped with a combination mill, calender, presses, and dry-heat, steam, and vacuum vulcanizers.

THE ACCOMPLISHMENT OF UNSELFISH COOPERATION.

The problem of supplying our soldiers with satisfactory gas defense equipment was a start from nothing, so far as knowledge in this country at our entrance into the war was concerned. Time and production were the key-notes. It called for much designing and many kinds of materials, and the rubber industry can be proud of the way in which it responded to the call. Fullest cooperation in development and production was given by every manufacturer involved. The proportion of development effort to production was so great and changes were necessarily so frequent that it can be said that the industry made no great war profits from gas-mask materials. In the matter of development cooperation it is desired to mention especially the work of Dr. W. C. Geer of The B. F. Goodrich Co. He became interested early in the great problem of gas defense and its tremendous possibilities; and gave unstintingly of his time in the solution of these problems. His ideas were a constant source of inspiration to the Service. Among the things which he produced was a better gas-mask fabric, a lower resistance exhalation valve, a telephone mask and a fighting mask which embodied the Akron Tissot principle, combined low resistance, and provided a carrying position of canister on shoulder away from chest, thus permitting the soldier to carry on offensive operations more successfully.

RUBBER TRADE INQUIRIES.

THE inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The editor is therefore glad to have those interested communicate with him.

(697.) A correspondent in Argentina requests catalogs and price-lists of druggists' and surgical sundries, with the object of securing the agency for these goods.

(698.) A subscriber requests the addresses of manufacturers of molds for rubber toys.

(699.) A subscriber desires information concerning Ruberine as a compounding ingredient.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

Addresses may be obtained from the Bureau of Foreign and Domestic Commerce or its district or cooperative offices. Request for each should be on a separate sheet, and state number.

(28,206.) An Englishman desires to import from America material and machine tools for manufacturing automobile tires and other rubber accessories.

(28,209.) A firm of brokers and agents in Ireland desires to communicate with exporters desiring direct representation in that country.

(28,210.) A Cuban desires to represent manufacturers of cotton goods, including ducks and drills.

(28,217.) An Italian desires an agency for traveling goods, imitation leather, etc. Correspondence should be in Italian. References.

(28,218.) A retail house in India desires to purchase sporting goods, motor tire tubes, motor cars, cycles, and accessories. Payment at Madras through bank. Will consider agency proposition. References.

(28,229.) An Italian concern desires an agency for boots and shoes, tools and machinery for their manufacture and repair, rubber goods, waterproof clothing, etc. Cash or 30 days' credit against security. Correspondence may be in English. References.

(28,233.) A firm in India desires to purchase erasers and other stationery. Quotations to be f. o. b. An agency for such supplies is also desired. References.

(28,235.) A Swedish firm wishes to buy rubber handles for cutlery, etc. Correspondence may be in English. References.

(28,242.) A commercial agent in Denmark desires an agency for rubber goods and other articles. Cash against documents. Correspondence may be in English. References.

(28,289.) A Norwegian firm desires an agency for the sale of rubber goods. Correspondence may be in English.

(28,312.) A Mexican firm desires to purchase screw bottle stoppers made of caoutchouc or gutta percha like samples to be seen at the offices of the Bureau. (Refer to Miscellaneous, No. 205.) These were formerly made in a European country.

(28,319.) A man in India desires to communicate with exporters for the sale to merchants in India of rubber tires.

(28,320.) A firm in Denmark desires to purchase and also secure an agency for tires for motor cars and lorries. Quotations f. o. b. New York. Terms, cash. Correspondence may be in English.

(28,323.) A Swedish firm desires to purchase belting, packing, etc. Correspondence may be in English.

(28,338.) A business man in Denmark desires to secure an agency on commission for the sale of rubber goods. Correspondence may be in English.

(28,352.) A Canadian desires to secure an agency for the sale of druggists' sundries. Quotations f. o. b. destination.

(28,255.) An Englishman desires an agency for the sale in Belgium of rubber heels and soles and leather substitutes. Terms, cash payments.

(28,376.) A French firm desires an agency for the sale of sporting goods. Correspondence in French.

(28,393.) A commercial agent in Algeria desires to secure an agency for the sale of rubber articles. Correspondence in French.

(28,394.) A man in Switzerland desires an agency for the sale of insulating materials, belting, etc. Correspondence may be in English.

(28,408.) An Italian desires to secure an agency for the sale of rubber goods. Correspondence may be in English.

(28,244.) A Canadian concern desires an agency for the sale of rubber goods.

(28,247.) A Norwegian firm desires to purchase supplies for the manufacture of waterproof clothing, sporting goods, etc. Quotations f. o. b. New York. Payment against documents. Correspondence may be in English.

(28,280.) A man in England desires to communicate with manufacturers of rubber footwear.

(28,253.) A Norwegian firm desires to purchase 100 cravanettes and 100 spring raincoats.

(28,260.) A Swedish importer desires to purchase rubber goods. Correspondence may be in English.

(28,287.) An Australian firm desires agencies for the sale of gums, resins, waxes, waterproofing compositions, rubber goods, etc. Catalogs, price lists, and particulars are requested.

POLISH COMMERCIAL AND INDUSTRIAL BUREAU.

Early in January the Commercial and Industrial Bureau of the Polish National Department was opened, with the object of assisting to establish commercial connections between the United States and Poland to collect and disseminate all necessary data and information for the success of this purpose.

The Bureau will be glad to furnish information concerning trade conditions and business possibilities in Poland to those interested. The offices of the organization are at 1032-1035 Aeolian Building, 33 West 42nd street, New York City.

Echoes of the Great War.

ADELBERT H. ALDEN IN WAR WORK.

FOR nearly four years Adelbert H. Alden has been engaged in war work in Europe, and when the United States entered the war he became interested in providing entertainment and caring for the American soldiers passing through London. When the American hospitals were established there both Mr. and Mrs. Alden devoted much of their time to the care of wounded Americans.

ADELBERT H. ALDEN.

In response to an invitation from a friend to spend Christmas in the States, Mr. Alden wrote:

We would desire to eat our Christmas dinner with you in the States, but there are some things which make it impossible. I feel I am of service here in the hospitals—at least for a time longer, as some of the wounded men seem to depend on me and I don't like to desert them, for when I have spoken of leaving them for home their words and manner have touched me deeply and I simply cannot do it. However, this condition of affairs will probably not continue very long, for the wounded are being evacuated back to the United States very rapidly and soon there should be non left here. They are the very finest lot of young men I ever saw.

In a later letter Mr. Alden writes:

Our hospital work is finished. All our wounded friends have departed and we plan to sail for home March 15th.

WHAT THE WESTINGHOUSE COMPANY DID TO HELP WIN THE WAR.

In a recent interview General Guy E. Tripp, who during the war was assistant to the Chief of Ordnance at Washington, D. C., but has now returned to his duties as chairman of the board of the Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania, spoke enthusiastically of the aid the Government received during the war from the men and women who make up our great commercial organizations. As an example, General Tripp pointed out the valuable contributions to the winning of the war which have been made by the Westinghouse organization and employes.

Not only did an army of 7,468 men, or about 20 per cent of the company's employes, go forth to fight, but a loyal industrial army of nearly 40,000 remained to operate the company's several great plants day and night, turning out vast quantities of war munitions of many sorts. Works, machinery, and workmen were turned over to the Government, including the services of inventors, engineers, chemists, and innumerable specialists. And when greater factory capacity was required, a plowed field at South Philadelphia, Pennsylvania, was, in less than a year, converted into a fully equipped industrial plant embracing seven large buildings and employing over 2,000 persons.

The Westinghouse organization also did much to assist financially in the campaign for Liberty Loans, Red Cross and United War Work Funds. The company and employes joined hands and the results are most gratifying. The employes alone subscribed for a total of $10,500,000 of Liberty Bonds, the company subscribing for $8,000,000, making a total of $18,500,000, or 1.08 per cent of the four Liberty Loans.

In the civilian personnel furnished the Government were a number of prominent men who performed invaluable services along their chosen lines. Among these might be mentioned, Benjamin G. Lamme, chief engineer, who was appointed by the Secretary of the Navy as a member of the Naval Consulting Board; vice-president L. A. Osborne, a member of the War Labor Board; Frederick Darlington, consulting engineer, head of Power Section of War Industrial Board—and many others doing equally important work.

THRIFT IN 1919.

The Government has taken steps to provide for a new issue of War Savings Stamps for 1919, similar to those put out during 1918. The new ones, however, are to be kept on special cards or folders and not combined with those of 1918. Similar rates are also announced, a War Savings Stamp in March, 1919, costing $4.14, and one cent additional during each subsequent month. The same kind of Thrift Stamps are being issued as were put out in 1918. Thrift Stamps purchased during 1918 may therefore be applied on War Savings Stamps of the current issue.

HOLD YOUR LIBERTY BONDS LOYALLY.

In connection with the buying of War Savings and Thrift Stamps and Liberty Bonds, the new Secretary of the Treasury, Carter Glass, deprecates the tendency in some directions to sell Liberty Bonds already acquired. He especially censures the exchange of these bonds, the best security in the world from the point of view of investment, for other securities of doubtful and sometimes worthless value, or for unnecessary purchases. He makes the point that as long as the Government needs to sell bonds, those who hold the present issue will show their unimpaired loyalty by retaining them except under the spur of the most urgent necessity. In such a circumstance, with the bonds as security, the best method of procedure is to negotiate a loan from some reputable bank, to be repaid later. The bond owner who disposes of his bond for cash outright does not help the Government, and perhaps the best test of his real loyalty and thrift lies in his ability to continue to practice self-denial and not purchase the small luxuries which the money to be obtained from the sale of a Liberty Bond would make possible.

EXPORTATION OF AUTOMOBILES AND BICYCLES TO DENMARK, NORWAY, SWEDEN AND HOLLAND.

In a new ruling (W. T. B. R. 588), the War Trade Board announces that in shipping automobiles and bicycles to the above countries, it will no longer be necessary to furnish with the application for export license an import certificate number covering the tires on such vehicles. The import certificate and export license issued for automobiles and bicycles will be deemed to include the necessary tires.

RESUMPTION OF TRADE WITH SERVIA AND ROUMANIA.

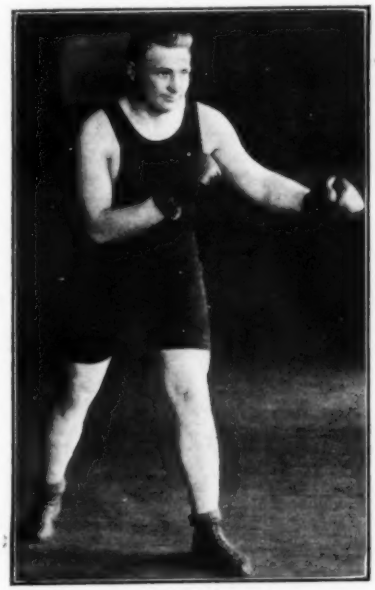
Trade with Servia and Roumania has been resumed, subject to the rules and regulations of the War Trade Board, and applications for import or export licenses for all commodities will now be considered. Applications for export licenses should be filed on Form X or X-a. No supplemental sheets are required for rubber goods. As the import regulations of these countries are unknown, prospective exporters should communicate with their customers before making shipments, in order that the importer may comply with the requirements governing imports to Servia and Roumania.

SON OF GEORGE B. HODGMAN HONORED IN FRANCE.

Corporal Alfred P. Hodgman, of the United States Army Ambulance Service Attached to the French Army, has recently been decorated with the Croix de Guerre for bravery during one of the German offensives last summer when he advanced beyond the front lines and rescued several wounded French soldiers. He is the second son of George B. Hodgman, president of the Hodgman Rubber Co., Tuckahoe, New York.

MR. KIRK, BOXING INSTRUCTOR.

More and more it is becoming evident that the men who toiled "behind the lines" did as much to win the war as those who went over the top. A case in point is that of the manager of the New York office of the Thermoid Rubber Co., J. N. Kirk, Jr. Always interested in athletics, and a splendid boxer, he was called upon early in the game to train recruits in the manly art. So successful was he that all of his spare time and much that was not to spare was given up in showing the embryo soldiers how to account for themselves with credit when brought face to face with opponents of any caliber.



JOHN N. KIRK, JR.

Although the armistice is signed, Mr. Kirk finds that when he is not selling rubber goods he is still called upon to continue his training work.

Incidentally he has learned that this extra work has been of great advantage to him. A 260-pounder at the beginning he now weighs 185 pounds and, as he explains it, instead of feeling fatly good-natured he is all of the new fitly good natured.

MARTYRS TO THE CAUSE OF LIBERTY.

THE total number for former employes of the United States Rubber Co. and associated companies in military service was 4,298. In all, 49 casualties have been reported, as follows: killed in action, H. Bartlett, Stanley Dublinski, Stanley Rikeski, George Lawson, T. F. Deady, Eopim Vorasoks, Salvatore Missri, Henry Pappagallo, G. A. Waldo, L. E. Richardson, J. F. Potter, Antoney Spino, F. Charles, James Mosher, R. Dulmage, T. F. Ryan, S. H. Young, M. D. Bacon, M. F. Cassidy; died of wounds, A. N. Allyn and Olaf Flink; died of pneumonia, influenza, accident and other causes: M. Bickerdike, Loren Smart, S. A. Sharles, J. H. Johnson, John Wasnick, George Shetler, M. Esikovich, R. MacDonald, J. Kerber, E. Whynott, H. Klein, Fred Cummings, Ira Valentine, Joseph Green, O. P. Friend, H. B. Bragdon, W. P. MacDonald; missing in action: N. Carabillo, F. G. Swan, C. H. Drechsell, T. McDonough; wounded, J. Marinitis, F. N. Champoux, J. W. Towsen, T. Farrell, O. Schaeffer, F. E. Topping, H. Fahrenholz.

Private C. Puorto, of the 316th Infantry, who was formerly employed in the carton department of the L. Candee Co., New Haven, Connecticut, has been killed in action.

RUBBER TIRES AND CLOTHING FOR NORWAY, SWEDEN, HOLLAND AND DENMARK.

The Allied Governments have materially increased the quantities of commodities allowed to be imported by Norway, Sweden, Holland and Denmark. All quantity limits have been removed from rubber tires, clothing and machinery. These commodities may now be licensed freely, subject only to the condition that appropriate import certificates have been issued. Exporters should request their customers in these countries to apply for such certificates.

INTERESTING LETTERS FROM OUR SOLDIERS.

SOLDIERS TO CARE FOR STILL.

THAT there are soldiers who still need and appreciate gifts from the home folks is vividly shown by the letter that follows. It was written to a member of the staff of THE INDIA RUBBER WORLD *who, through a friendly colonel, discovered a private without kith or kin and "adopted" him as far as sending cheering letters, tobacco, books, magazines, etc. There are others and they "sure appreciate" attention.*

ON THE MEXICAN BORDER.

DEAR FRIEND:—Received your package of sox, tobacco and papers. I don't understand how you happen to understand my needs, but you come to the rescue every time. We happen to be so far from civilization that there's hardly an essential within fifty miles of this place. Last Saturday when your package arrived there were only about six smokes left in our crowd and those went after breakfast, and just think of it, we didn't have a smoke until three o'clock that afternoon when the mail arrived and I received the package. I don't believe a soldier ever received a package that was more appreciated than that one and also the magazines—the boys just went *loco* over them. I guess you know how much I thank you.

I asked the Captain if I could do a little trapping during my spare time and he said I could. As there are grey fox and coyote in these parts you see I will have something to do to relieve the monotony.

It may be six months before we get a discharge from this district and so I am still in hopes of another good scrap with the "Spicks." We feel a little bit as if we had done our "bit," and knowing that our regiment has guarded almost 2,000 miles of the Mexican border line, perhaps you will realize our task is no small one. I'd do ten years more in service just to be able to show those "Spicks" a good cleaning up.

This place is sure some place. It is 105 miles from the railroad, right on the edge of the desert, a town of about 300 people, most of them miners, and a sort of a supply base for the troops on the river. The mails go out but once a week by motor stage. When we first arrived my old job of "skinning mules" was mine again and I had some great trips across the desert for supplies, usually all-night trips, and it sure was some cold.

When I get my discharge I hope to join the Government Ranger Forces on the border, and have already sent in my application.

I've got to close as I have to get about my duties. Thanking you again for your many kindnesses,

Respectfully yours,

MORE ABOUT THE THIRD BORDEAUX SAMPLE FAIR.

Literature concerning the Third Bordeaux Fair, to be held in Bordeaux, France, from May 31 to June 15, 1919, which has been received by the Bureau of Foreign and Domestic Commerce and its district or cooperative offices (refer to File No. 110760a), includes (a) application blanks for participation in the fair; (b) sample contracts for advertising space in the official catalog; and (c) pamphlets describing the plan of the buildings and their location on the Place des Quincones, together with data relative to accommodations, etc.

John M. Chapman, 101 Park avenue, New York City, is the official representative of the fair in this country, and further information may be obtained from him.

What the Rubber Chemists Are Doing.

COMPARATIVE METHODS FOR DETERMINING THE STATE OF CURE OF RUBBER.

A VALUABLE paper by Henry P. Stevens on comparative methods for determining the state of cure of rubber, appeared in the "Journal of the Society of Chemical Industry," August 31, 1918, page 280r. Tabulated data of physical tests and curves are given, showing the relationship of the coefficient of vulcanization to breaking load and time of cure for ordinary crêpe and smoked sheet.

The state of cure or degree of vulcanization of rubber may be formulated in reference to (1) the percentage of combined sulphur calculated on the rubber present, which is the coefficient of vulcanization; (2) the physical properties of the vulcanizate, particularly the load supported per unit cross-sectional area at a given elongation or *vice versa*. The former method is independent of the age and external conditions of the vulcanizate, while the latter is dependent on these conditions. It is therefore necessary to make a careful comparative study of the coefficients and the corresponding physical properties under varying conditions before the latter can be taken as a measure of the condition or state of cure. I have already shown that the physical properties are dependent on the age of the vulcanized specimen,[1] so that comparable results are only obtainable when the specimens are tested at a fixed period subsequent to vulcanization. The present results show that the temperature also has a considerable influence on the physical properties, and uniform conditions must be observed in order to obtain comparable figures.

SUMMARY.

The position of the stress-strain curves is appreciably influenced by the period elapsing between vulcanizing and testing the rubber and by the temperature. Hence, the results are only comparable when these conditions are kept constant. Results obtained in summer are not comparable with those obtained in winter, nor those obtained in the tropics with those obtained in Europe.

The position of the stress-strain curves is influenced by the type of rubber, that is, whether crêpe or sheet, probably owing to a variation in the proportion of non-caoutchouc ingredients.

The coefficient of vulcanization is independent of the above and other conditions and is therefore a more reliable index of the rate of cure. In any case, if the stress-strain curves are to be taken as an index of the state of cure, it is essential that these curves be obtained under standard conditions.

Of particular interest is the greater curvature of the graphs for crêpe from matured coagulum than of those for ordinary crêpe and sheet. This may be attributed to the larger proportion of accelerating base contained in the former.

To insure as great a degree of uniformity as possible, all speciments should be tested as soon as possible after vulcanization, for instance, the next day; and between vulcanizing and testing, the specimens should be kept as nearly as possible at 30 degrees C.

VULCANIZATION RESEARCHES.

B. J. Eaton summarizes the vulcanization researches of the chemical laboratory of the Agricultural Department of the Federated Malay States for the first half of 1918, as follows:

The principal investigation has been on the effect of different alum salts used as coagulants. The writer has previously shown that common potash alum, when used as a coagulant, has a very deleterious effect on rubber, especially in regard to its effect on the rate of cure. The subject is of considerable importance since, owing to the rise in price of acetic acid, the use of alum by Asiatic small holders has increased considerably, and the result, with the comparatively large amount of rubber from such holding now being manufactured, may give a bad name to plantation Pará rubber. American manufacturers, who have been large buyers of rubber from such sources on the Singapore market, have previously drawn attention to the subject.

The present investigation was carried out to ascertain whether the different alum salts had a similar effect and the result of the investigation has shown that such is the case. The effect of the following alum salts was investigated: potash alum (pure), commercial potash alum, soda alum, ammonia alum and aluminum sulphate. The use of alum salts generally as coagulants should therefore be discouraged.

The effect of alum as a retarding agent in vulcanization, and of some other substances, namely, mineral acids, has not yet been investigated on a scientific basis with a view to ascertaining whether the effect is due to the bactericidal or anti-enzyme action of these substances or their effect as direct negative catalysts in vulcanization. Experiments with certain other reagents, described below, indicate that these substances behave directly as negative catalysts or retarding agents in vulcanization.

EFFECT OF CERTAIN CHEMICALS WHEN ADDED TO FINISHED DRY RUBBER.

When used as coagulants the various salts or acids may retard vulcanization by virtue of their bactericidal action on the organisms or enzymes which bring about the changes in raw rubber during the maturation period of six to seven days. By adding these chemicals, however, to the finished rubber, any effect must be due to a neutralization of the effect of the natural accelerator or to a direct negative effect of the chemical added.

The following substances have so far been tested in this manner: starch (as a neutral organic adjunct), boracic acid, tannic acid, molybdic acid and phosphotungstic acid used as precipitants of proteins, amines and basic nitrogenous compounds.

All of these substances, with the exception of starch, when added to the extent of one to two per cent of the rubber-sulphur mixing, had a very marked effect in retarding vulcanization, both in the case of "slab" crêpe and crêpe samples. Generally the larger amount had a greater effect than the smaller, and the effect appears to be specific, that is to say, the vulcanization of the "slab" crêpe is retarded to a certain extent, but is not as slow as the slow-curing crêpe which had been treated similarly. Rubbers having different rates of cure due to different amounts of the natural accelerators present, are not all brought to th same degree of slowness in the vulcanization.

DETERMINATION OF UNCOMBINED RUBBER IN RECLAIMED VULCANIZED RUBBER.

The following method is that of André Dubosc in "Le Caoutchouc et la Gutta-Percha," November 15, 1918, page 9646.

The value of a reclaimed rubber depends on the amount of caoutchouc it contains in free or uncombined condition. The following method of analysis requires certain precautions and considerable care, but gives very exact results.

APPARATUS FOR CHLORHYDRATION.

The sample for analysis reduced to 120-mesh fineness which may be done easily after swelling it in a mixture of the tetrachloride and sulphide of carbon and drying at 60 degrees C. before sifting. Ten grams of the powdered sample is weighed for chlorhydration. This is placed in a flask provided with two tubulures, one of which is connected to a source of cold, dry, hydrochloric-acid gas, and the other to an absorption flask containing a solution of caustic soda or milk of lime and connected to a vacuum pump to facilitate the passage of the gas through the sample. Cork stoppers boiled in paraffine are used to close the tubulures and the inlet and outlet gas tubes pass loosely through them to permit rotating the flask for the purpose of exposing fresh surfaces of the powdered rubber to the action of the gas. The lower part of the gas flask is cooled in water or a freezing mixture to prevent overheating the mass. A double-walled container or any water-sprinkling arrangement may be used for cooling. The temperature of the powder is not allowed to exceed 30 to 35 degrees C.

[1] "Journal of the Society of Chemical Industry," 1916, page 872.

The apparatus for generating the hydrochloric gas consists of a double tubular flask containing hydrochloric acid at 22 degrees Beaumé. To one of the tubulures is attached a funnel with an S-bend for safety against back pressure of the gas forcing out the supply of sulphuric acid contained in the funnel.

The length of the branches of the S-bend may be 15 to 20 centimeters. For drying the gas the second tubulure of the apparatus connects with two tubes containing broken pumice wet with sulphuric acid, and with a gas washer filled with fuming sulphuric acid. The gas generator is stoppered with paraffine-boiled, tinfoil-covered cork stoppers and sealed with paraffine. Sulphuric acid (66 degrees Beaumé) is delivered from the funnel, drop by drop, into the dilute hydrochloric acid in the flask. The hydrochloric gas disengaged carries along a little hydrochloric acid and moisture. The latter is retained by the pumice, which serves as a gas filter and dehydrator. The gas produced should not react blue on powdered copper sulphate. The passage of gas through the powdered rubber is easily controlled by regulation of the vacuum connection with the flask and absorption train. The application of vacuum is made cautiously so that the sulphuric acid will not be drawn into the generator abruptly. The difference in level should not exceed two to three centimeters of mercury in order that the contact of the gas with the powdered rubber may be as prolonged as possible.

CHLORHYDRATING EFFECT.

The action of the gas on the rubber liberates some heat. This temperature is not allowed to exceed 35 degrees C. The chlorhydration reaction proceeds slowly, and if the temperature rises, the mass tends to become sticky at 35 degrees C., the powder becomes a little tacky but does not unite enough to prevent passage of the gas.

Complete chlorhydration requires 24 hours. The product obtained is nearly white and retains its elasticity. It is removed from the flask, washed with warm water, then with cold, until the wash water is free of acid. Next follows washing with warm alcohol, then with cold alcohol, drying at 60 degrees C., and cooling in a dessiccator. The rubber is then in the form of an easily pulverizable white powder, insoluble in alcohol, ether, acetone, benzine and sulphide of carbon. It consists of a mixture of three chlorhydrates of caoutchouc: (1) chlorhydrate of polyprene sulphide, (2) chlorhydrate of stable (vulcanized) caoutchouc, (3) chlorhydrate of metastable (unvulcanized) caoutchouc, or caoutchouc in its natural state. The first two forms are completely insoluble in chloroform, while the third is completely soluble.

SEPARATION OF CHLORHYDRATED PRODUCT.

There are three different methods by which the amount of unvulcanized caoutchouc in the sample may be determined.

1. A known weight of the dry chlorhydrated material is treated with chloroform and the insoluble residue dried at 60 degrees C., cooled in a desiccator, and weighed. The difference between the two weights gives that of the chloroform soluble chlorhydrate or unvulcanized caoutchouc. The formula for this chlorhydrate is $C_{10}H_{18}Cl_2$, therefore 1.99 grams of the chlorhydrate correspond to 1.36 grams of caoutchouc.

2. The unvulcanized caoutchouc may be similarly calculated from the weight of dry residue obtained by evaporation of the chloroform extract.

3. The dry chlorhydrate, if treated on a water-bath with pyrridine or pyrridine bases, gives up its hydrochloric acid and assumes the gummy state of unvulcanized caoutchouc. Aniline has the same reaction, but the unvulcanized caoutchouc is partly soluble in it, necessitating precipitation. The use of pyrridine is the more practical, as follows: the chlorhydrate of unvulcanized caoutchouc is extracted for six hours with 100 cc. of pyrridine, using a reflux condenser. The caoutchouc, which floats as white threads in the liquid, is received on a tared filter; to the filtrate is added twice its volume of acetone to precipitate the dissolved caoutchouc. The residue is washed with hot and with cold acetone, then with 95 per cent alcohol, dried at 60 degrees C. in vacuum, cooled in a desiccator, and weighed.

The caoutchouc thus separated has all the characteristics of the natural gum. It is elastic, slightly sticky, easily erases pencil marks, and dissolves completely in all the usual caoutchouc solvents forming viscous solutions.

Before making this determination it is well to eliminate from the vulcanized rubber the different organic additions which it may contain and which may render the results faulty, by making preliminary extractions with acetone, chloroform and alcoholic-potash.

This process is not only suitable as an analytic method, but can be utilized industrially for the separation of unvulcanized caoutchouc present in waste rubber.

CHEMICAL PATENTS.

THE UNITED STATES.

COMPOSITION FOR SOLES.—Composition and soles of vulcanizable material consisting of a mixture of comminuted waste felt roofing saturated and treated with asphaltum and boiled linseed oil; reclaimed rubber, litharge, sulphur, and zinc oxide. (George R. Wyman and Andrew E. Currier, assignors to Charles S. Bird, all of Walpole, Massachusetts. United States patent No. 1,284,023.)

ARTIFICIAL RUBBER AND PROCESS OF MAKING.—A composition of matter for use in the manufacture of artificial rubber, including vulcanizable vegetable oils, resinous hydrocarbon bodies, camphor, powdered shale and sulphur. (Edwin R. Talley, Grinnell, Iowa. United States patent No. 1,285,463.)

RUBBER DERIVATIVES AND PROCESS.—A plastic oxidation product of rubber produced by treating a natural rubber with an oxidizing agent (ozone) in the presence of water and copper oleate. (Walter O. Snelling, Pittsburgh, Pennsylvania, United States Patent No. 1,288,723).

SYNTHETIC RUBBER PROCESS.—A process of making a rubber-like substance by synthesis which comprises heating a mixture of pinene and an acid until the pinene is changed into limonene raising the temperature of the mixed vapors until the limonene is partly changed into a rubber-like substance, condensing the vapors, and removing the acid. (Louis Gottschalk, Metuchen, New Jersey; Esther J. Gottschalk, administratrix of said Louis Gottschalk, deceased. United States patent No 1,289,444.)

MATERIAL COMPRISING METAL AND VULCANIZED RUBBER.—Rubber vulcanized by an agent containing oxygen and a metallic material attached thereto. (Albert A. Somerville, Flushing, New York, and Mahlon J. Rentschler, Willoughby, Ohio, assignors to Rubber Regenerating Company, Naugatuck, Connecticut, United States patent No. 1,289,566.)

PROCESS OF PREPARING TIRE-TREADS.—On a tire-tread a band of vegetable fiber is formed, impregnated with hot tar and rosin. After cooling, grit is applied to the prepared surface. (Delaska A. Kendall, San Diego, California. United States patent No. 1,290,576.)

THE DOMINION OF CANADA.

VULCANIZABLE COMPOSITION AND PRODUCT.—A vulcanized, composition rubber product comprising natural and reclaimed rubber, coumarone resin, sulphur, and extending materials. (Alfred Alonzo Wells, Montclair, N. J., U. S. A. Canadian patent No. 186,812.)

TREATMENT OF FABRIC.—The treatment of fabric by impregnation and the product of the process patented. The process

consists of treating the fabric with an emulsionized lubricant produced by a basic emulsifying agent adapted to produce a capillary impregnation of the fabric, evaporating the volatile carrying liquid and subsequently applying a vulcanizable compound. (The Canadian Consolidated Rubber Co., Limited, Montreal, Quebec, Canada, assignee of Erwin E. A. G. Meyer, Detroit, Michigan. Canadian patent No. 186,407.)

THE UNITED KINGDOM.

SUBSTITUTES FOR INDIA RUBBER.—Substitutes for india rubber are made by mixing together a fatty oil, sulphur or compound of sulphur, and stearine or other hard fat, with or without other ingredients, and then heating them. The following is one example of ingredients and proportions: linseed oil, 1 part; sulphur, 1 part; stearine, 1 part; oxide of iron, ½ part. A small proportion of tar, or resin or other pitch-like substances may be added. Also, lime may be added. The material may be strengthened by adding sawdust, cellulose in the form of cotton, jute, and paper. The material forms a varnish with most of the well-known rubber solvents. (F. J. Bennett, Gordon Cross House, Dronfield, Derbyshire, and F. W. Mellowes, Corporation Works, Corporation street, Sheffield, England. British patent No. 119,878.)

LEATHER SUBSTITUTE.—Relates to rubber substitutes of the kind containing scrap and new rubber, scrap leather, and cotton or other vegetable fiber. It may include a coloring agent and slate or cement for increasing the weight. (J. L. Watkins, 1 Jeffrey's road, Clapham road, London. British patent No. 119,902.)

COLORED RUBBER.—A sheet of rubber or fabric is provided with pigment, as aluminum powder, in its outer layer only, the pigment being embedded by vulcanization so as to produce a smooth glossy surface. (W. J. Mellersh-Jackson, 28 Southampton Buildings, London, England. [India Rubber Co., 1790 Broadway, New York.] British patent No. 120,824.)

HALOGENATING RUBBER.—Alkyl, alkylene, alkenyl, and aryl halides, such as trichlorethylene and tetrachlorethane, are used as solvents in the making of halogenated india rubber, gutta percha or balata. (S. J. Peachey, 5 Yew Tree Road, Davenport, Stockport, England. British patent No. 121,091.)

AUSTRALIA.

TIRE SEALING COMPOSITION.—This is identical with U. S. patent No. 1,271,015 (THE INDIA RUBBER WORLD September 1, 1918, page 723.) (Puncture Cure, Limited, assignee of Ernest Campbell and T. F. Cushman, Calgary, Alberta, Canada. Australian patent No. 5,872.)

BOX-TOE STIFFENER.—A self-hardening compound consisting of asphaltum, paraffine wax, carnauba wax and gutta percha for use in molding under heat and pressure to form desired. (J. H. Ordway, Massachusetts, U. S. A. Australian patent No. 5,933.)

THE FRENCH REPUBLIC.

COLORED RUBBER.—Process of making colored rubber and products obtained by the aid of rubber. Same as British patent No. 102,824. (India Rubber Co., 1790 Broadway, New York City, U. S. A. French patent No. 488,372.)

ESTIMATION OF UNSAPONIFIABLE RESINS IN RUBBER.

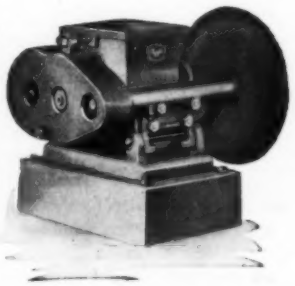
The following abstract from the "Journal of the Society of Chemical Industry," volume 37, 341A, outlines the method of P. Dekker on the estimation of the content of unsaponifiable resins in various kinds of rubber mixings:

When the mineral oil in a rubber mixing is estimated by the measurement of the unsaponifiable portion of the acetone extract which is soluble in petroleum ether, the accuracy of the result is affected by the fact that a part of the rubber resins resists saponification and is included with the mineral oil. The oxidation products of rubber are completely saponifiable, and the ordinary method of analysis includes them with the saponifiable resins.

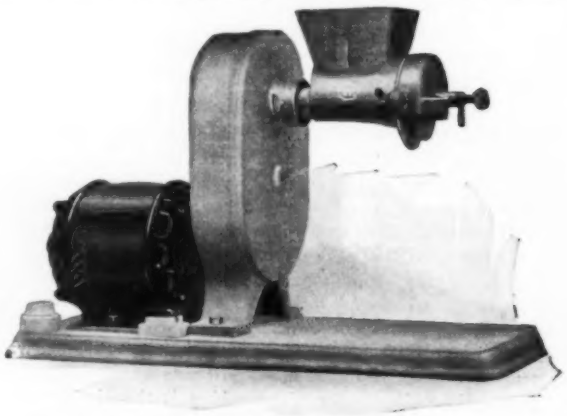
LABORATORY APPARATUS.

LABORATORY GRINDING AND KNEADING MACHINES.

THERE is daily occasion in the rubber laboratory, as in many others, for grinding and mixing machines in the preparation of samples where the ordinary roller mixer is not suitable. This requirement is met most effectively by the new series of grinding and kneading or mixing machines here illustrated. They are built in three laboratory sizes. Both grinder and mixer are electrically driven. The former has a very unique feature in its interchangeable grinding units. These units can be furnished for either wet or dry grinding and are easily joined with or separated from the power unit. This permits a number of these interchangeable grinding units to be kept on hand,



LABORATORY MIXER.



LABORATORY GRINDER.

each unit being used for a separate purpose. (Werner & Pfleiderer Co., Inc., Saginaw, Michigan.)

ABBE REFRACTOMETER.

The Abbé refractometer is shown in the illustration as manufactured by Adam Hilger, Limited, 75a Camden Road, London, N. W. In addition to its well-known general use as a laboratory instrument for the identification of oils, resins, etc., the Abbé refractometer here referred to is coming into use for the control of solutions of rubber and the solvents used in their manufacture. These instruments are standardized and the parts are interchangeable, a matter of great convenience in repair replacement. It is suggested that this refractometer might form a valuable aid in dealing with such problems as the following:

ABBÉ REFRACTOMETER.

Ascertaining degree of vulcanization of lightly cured goods.

The determining of resin in rubber.

The establishing of some relation between the quality of different rubbers, and such an easily measured physical property as the refractive index. (Eimer & Amend, 211 Third avenue, New York City.)

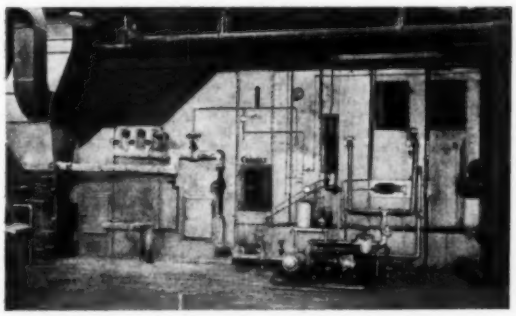
New Machines and Appliances.

"CONDITIONING"—A NEW RUBBER-DRYING SYSTEM.

SINCE rubber first became an article of industrial importance the drying of the crude, after washing and preparatory to compounding, has constituted a problem of great interest to rubber manufacturers everywhere.

The so-called "natural drying method," adopted at first because it seemed the most obvious expedient, consisted in hanging the washed sheets over horizontal racks and subjecting them to the chance effects of atmospheric conditions. This method required from two to five weeks, in some cases even longer, and though the quality of the rubber so dried was good, the impossibility of establishing a routine, and the amount of money rendered non-productive for long periods, led to the abandonment of this process, in favor of more advanced methods.

Recently there has been perfected a system which is called "conditioning" as distinguished from "drying," because the results obtained are due to the use of conditioned air, applied somewhat differently from the manner previously employed. In this system the sheets are placed on trays, racked in tiers on trucks, and the trucks placed within a dry-room constructed of dressed and matched lumber over a 2 by 4 framework. The



THE CARRIER DRYER.

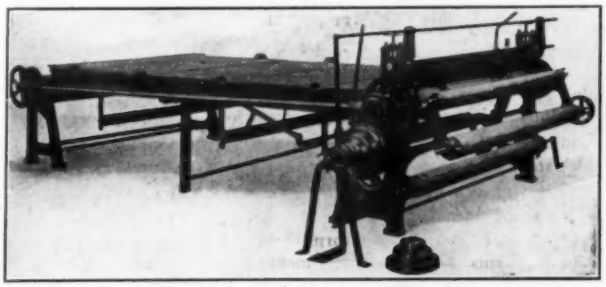
dry-room is provided with conditioned air through a set of ejector nozzles in such manner that an absolutely positive and uniform circulation is maintained throughout every cubic foot of space enclosed by the kiln. Before the air is admitted through the nozzles it is conducted through a humidifier, wherein it is washed free of impurities (ammonia gas, if present) and automatically brought to an exact, predetermined degree of humidity. Leaving the humidifier, the air is drawn through a ventoy or steam-coil heater, brought to the required temperature, and admitted to the kiln through the ejector nozzles.

Not only is circulation within the kiln insured by means of the nozzles, but re-circulation is provided so that all of the air within the kiln is periodically removed and replaced with clean air. Constant humidity is thereby maintained, and maximum efficiency secured by automatically recirculating as much of the heated kiln air as possible. The system is entirely automatic in its operation, thus avoiding expense and obviating carelessness. (Carrier Engineering Corp., 39 Cortlandt street, New York City.)

FRENCH HORIZONTAL SPREADING MACHINE.

This type of spreader is commonly used in France, although the vertical machine is sometimes preferred for special work. While the horizontal type is built along the general lines of spreader construction, certain details, however, are different, and therefore of interest.

The rubber-covered feeding roller is 7⅛ inches in diameter, 78.7 inches long, and is provided with an adjustable spreading knife and adjustable, compound guides. The cast-iron hot-plates are eight in number, each section measuring 78.7 inches



FRENCH SPREADER.

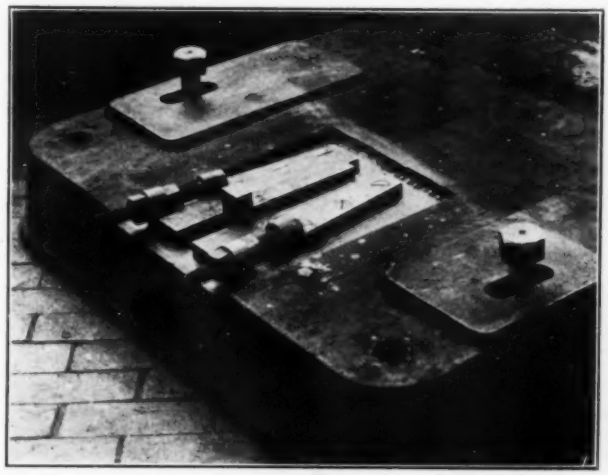
long by 19 11/16 inches wide and being provided with steam inlet and outlet connections.

The machine is belt-driven by a 3-step cone pulley and equipped with friction clutches, controlled by a bar extending over the front of the machine within reach of the operator, for starting and stopping the machine.

The rear fabric roller is driven from the front shaft by bevel gearing and a shaft connected by bevel gearing to the back roller and operated at the front by a hand-lever. The wind-up roller at the front is provided with a speed accelerator for rewinding the proofed fabric. (F. Soyer, 80-84 rue des Pyrénées, Paris, France.)

ADJUSTABLE ANCHORAGE FOR MOTORS.

In setting up electric motors of 50-horse-power and over, considerable skill is required to obtain perfect alinement, and for that purpose clearance is usually allowed in the bolt holes for final adjustment. With the adjustable anchorage device, this is not necessary, as the motors can be moved accurately in any direction in a horizontal plane. Installations, therefore, may be



ANCHORAGE FOR MOTORS.

made without close measurements, as the final alinement is easily accomplished by adjustable wedges.

Where very fine adjustments are required, as on magnetic clutches, it is important that no eccentric movement shall occur.

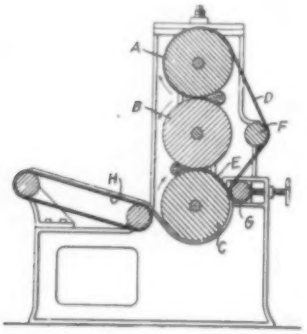
This often happens through wear of one or the other of the bearing boxes on either the motor or shaft, throwing them out of alinement, which in a short time destroys the journal boxes. It is then necessary to rebabbitt the journal boxes and realine the motor. This expensive procedure can be obviated by the use of the adjustable anchorage.

In case the journal boxes wear unevenly the motor can be rotated and easily brought up into position again, whereas without the adjustable anchorage the grooves in the base of the motor must be planed out to allow this movement. (Adjustable Anchorage Co., 1502 Ford Building, Detroit, Michigan.)

MACHINERY PATENTS.

CALENDER FOR FORMING AND JOINING RUBBER SHEETS.

A PLURALITY of rubber sheets are calendered sufficiently thin to avoid blisters, and superposed by this machine, forming a multiple-sheet of desired thickness for making tire-building strips. In the operation, rubber stock is fed between rolls *A* and *B*, and also between *B* and *C*, forming banks shown in the illustration. As the rolls rotate in the direction indicated by the arrows, the rubber is formed into relatively thin sheets, *D* and *E*. The upper sheet *D* passes over idler roller *F* and under pressure roller *G*, where it is united with sheet *E* and then delivered from the machine by the conveyor *H*. A multiple sheet is thus formed that will be free from blisters and devoid of the usual imperfections encountered in calendering thick sheets. Three or more plies may be formed by providing rolls for each additional ply. (John Hanna, assignor to The Fisk Rubber Co., both of Chicopee Falls, Massachusetts. United States patent No. 1,289,744.)



MULTI-PLY SHEET CALENDER.

OTHER MACHINERY PATENTS.

THE UNITED STATES.

NO. 1,287,071. Vulcanizing apparatus. W. C. Merrill, assignor by mesne assignments to The Merrill Process Co.—both of Boston, Mass.

1,287,253. Machine for kneading rubber, etc. S. C. Davidson, Belfast, Ireland.

1,287,256. Vulcanizing press. P. and B. De Mattia, Clifton, N. J.

1,288,181. Vulcanizing press. J. Pollak, Dorchester, Mass.

1,288,601. Apparatus for making elastic body-belting web. J. Jacobs, assignor to The Live Leather Belt Co.—both of New York City. (Original application divided.)

1,288,641. Fabric-coating machine. C. W. Mayer, Rochester, N. Y.

1,288,642. Web-saturating machine. C. W. Mayer, Rochester, N. Y.

1,288,643. Stretching device for web-carrying rolls. C. W. Mayer, Rochester, N. Y.

1,288,733. Tire-opening machine. W. C. Stevens, assignor to Firestone Tire & Rubber Co.—both of Akron, O.

1,288,746. Fabric-testing machine. S. P. Thacher, Weehawken, N. J., assignor to Revere Rubber Co., Providence, R. I.

1,288,862. Tire-building machine. G. F. Fisher, Roselle, N. J., assignor to Morgan & Wright, Detroit, Mich.

1,289,033. Rubber-tubing machine. W. P. Bradley, assignor to Revere Rubber Co.—both of Providence, R. I.

1,289,043. Apparatus and process for vulcanizing rubber goods. A. I. Comstock, assignor to American Rubber Co.—both of Boston, Mass.

1,289,233. Core-handling apparatus for tire-building machines. De C. Neal and A. O. Abbott, Jr., assignors to Morgan & Wright—all of Detroit, Mich.

1,289,324. Device for manipulating rubber stock. H. C. Wagner, assignor to Woonsocket Rubber Co.—both of Woonsocket, R. I.

1,289,746. Tire mold. A. Hargraves, assignor to Firestone Tire & Rubber Co.—both of Akron, O.

1,289,768. Apparatus for manufacturing pneumatic tires. E. Hopkinson, New York City.

1,289,769. Mold for pneumatic tires. E. Hopkinson, New York City.

1,289,770. Mold for pneumatic tires. E. Hopkinson, New York City.

1,289,773. Vulcanizing apparatus for pneumatic tires. E. Hopkinson, New York City.

1,289,774. Apparatus for manufacturing pneumatic tires. E. Hopkinson, New York City.

1,289,775. Pneumatic-tire-building machine. E. Hopkinson, New York City.

1,289,949. Apparatus for manufacturing automobile tires. W. C. Stevens, assignor to Firestone Tire & Rubber Co.—both of Akron, O.

1,289,983. Mold for plastic materials. H. Weida, Highland Park, assignor to India Rubber Co., New Brunswick—both in N. J.

1,290,505. Rubber-working machine. G. W. Bulley, St. Joseph, Mo.

1,290,731. Apparatus for vulcanizing rubber articles. J. R. Gammeter, Akron, O., assignor to The B. F. Goodrich Co., New York City.

THE UNITED KINGDOM.

120,332. Calendering machine. C. H. Crockwell and Sir J. Farmer & Sons, Adelphi Iron Works, Salford, Manchester.

120,563. Apparatus for making tire covers. W. B. Harsel, 1144 East Market street, and E. A. Nall, 152 Grand avenue—both of Akron, O., U. S. A. (Not yet accepted.)

120,564. Apparatus for making tire covers. W. B. Harsel, 1144 East Market street, and E. A. Nall, 152 Grand avenue—both of Akron, O., U. S. A. (Not yet accepted.)

120,660. Machine for forming rasp-like teeth on rims for supporting rubber tires for motor trucks, etc.

120,699. Repair apparatus for vulcanizing tires. J. B. Stroud, Pass Christian, Mississippi, U. S. A.

THE DOMINION OF CANADA.

187,451. Machine for molding tire covers on a rotating core. F. H. Mercer and H. H. F. H. Bleas, both of Meksham, Wilts, England, co-inventors.

PROCESS PATENTS.

THE UNITED STATES.

NO. 1,287,095. Process for rubber-coating fibers, cords, etc., partially curing same, twisting to increase size, and building into an article of manufacture and curing. R. B. Price, New York City, assignor to Rubber Regenerating Co., Naugatuck, Conn.

1,287,429. Manufacture of vulcanized rubber water-bags, etc. R. B. Price, New York City, assignor to Rubber Regenerating Co., Naugatuck, Conn.

1,288,253. Process of cementing together leather and rubber heel sections and attaching to a shoe, etc. J. F. Standish, Winthrop, Mass., assignor by mesne assignments to United Shoe Machinery Corp., Paterson, N. J.

1,289,223. Method of forming collapsible cores for tires. Thos. Midgley, Sr. and Jr., Columbus, O.

1,289,767. Building pneumatic-tire casings. E. Hopkinson, New York City.

1,289,772. Building pneumatic-tire casings. E. Hopkinson, New York City.

1,289,776. Vulcanizing rubber articles. J. L. Mahoney, New Haven, assignor to The Goodyear's India Rubber Glove Manufacturing Co., Naugatuck—both in Conn.

1,290,692. Producing waterproof footwear. J. A. Ames, Nashville, Tenn.

THE FRENCH REPUBLIC.

488,509. Manufacture of artificial leather. J. Schmid.

AUTOMATIC LAMP-CORD REEL.

A very practical device and one that suggests a variety of uses in every rubber mill, is the automatic extension reel for electric lamps. Designed primarily for garages, this reel has been installed in factories, machine shops, warehouses, and storerooms with satisfactory results.

LAMP-CORD REEL.

The reel is 9 inches in diameter by 2 inches wide and carries 25 feet of reinforced lamp cord. The head is provided with a swivel joint, so that the lamp may be carried in any direction from the reel, and an automatic lock checks the cord at any point. A slow, backward motion of the cord causes the lock to hold the cord and the release is effected by a slight pull, the cord being automatically rewound on the reel. (W. S. Broadhurst, 37-41 Cortlandt street, New York City.)

The New York Automobile Show.

THE New York Automobile Show for 1919 was held under the auspices of the Automobile Dealers' Association, Inc., of New York, in Madison Square Garden and the 69th Regiment Armory, February 3-15.

The first week was devoted to the exhibition of passenger cars and the second to commercial vehicles, with accessories on exhibition in the gallery and a portion of the basement at the Garden, during both weeks. The attendance, interest, and sales at each section of the show were phenomenal.

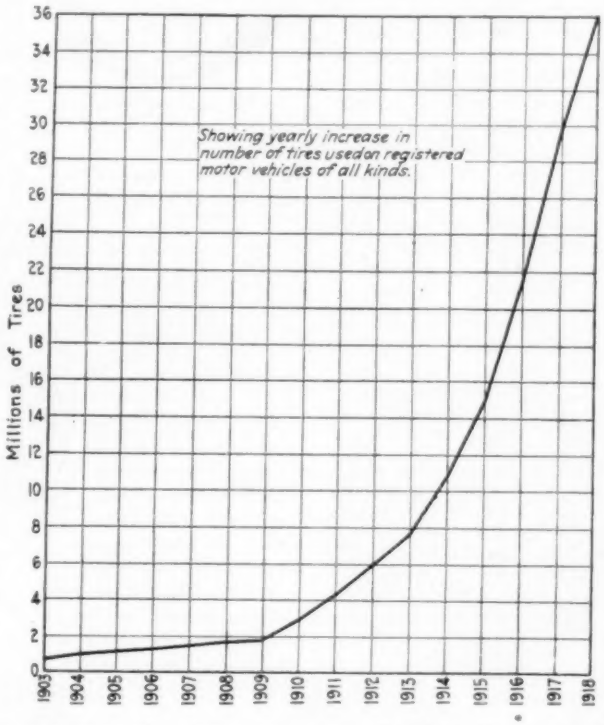
THE PASSENGER CAR SECTION.

The outstanding feature of the passenger car exhibition was the fact that closed cars greatly predominated. This seems to be a very sensible development as the fixed top of the closed car body obviates delay and labor incident to erecting the removable top of the ordinary touring car, often necessary under trying circumstances.

By its permanent structure the closed body affords better protection against dust and weather conditions, without appreciably diminishing the advantages of light and air. This development in car bodies will be more appreciated by car users than by manufacturers of rubber and artificial leather automobile topping materials, as it promises to eliminate much of the former demand for such goods.

Another noticeable feature is the steady increase in appreciation of the cord tire, especially on the more expensive and heavier cars.

Certain of the accessories exhibits were of special rubber interest although there was a marked scarcity of new features in this department of the show.



RUBBER ACCESSORY EXHIBITORS.

THE BULL'S EYE RUBBER CO., Long Island City, New York. A self-curing patch for inner tubes.

A. SHRADER'S SON, INC., Brooklyn, New York. Maker of tire valves and tire-pressure gages, exhibited the well-known specialties of this company.

THE STORY RUBBER CORP., New York City. Bonner self-heating inner tubes, closing punctures by compression of the specially constructed tread.

DURAL RUBBER CORP., Flemington, New Jersey. Antimony-red hand-made inner tubes.

PARA-BELL RUBBER CO., Columbiana, Ohio. Tires and tubes.

EASTERN RUBBER CO., Philadelphia, Pennsylvania. Magic Mend for repairing inner tubes.

GEO. H. RIVES MANUFACTURING CO., INC., New York City. Auto pedal pads.

THE COFFIELD TIRE PROTECTOR CO., Dayton, Ohio. A thick tread protector of firm elastic rubber without fabric which functions by turning and clinching nails that may pierce the tread of the tire casing.

J. & D. TIRE CO., Charlotte, North Carolina. Pneumatic tires guaranteed for 5,000 miles.

GATES RUBBER CO., Denver, Colorado. Gates Half-Sole tires and Gates tested tubes.

THE NORWALK TIRE AND RUBBER CO., Norwalk, Connecticut. High-Pressure casings and tubes.

DUPLEX TIRE CO., INC., New York City. DuPlex non-skid tires.

CARLISLE CORD TIRE CO., New York City. Carlisle cord tires, specially constructed with two plies of single unbroken strands of rugged, large-diameter cotton cord.

THE SHAW TIRE CO., Boston, Mass. A leak-proof molded endless inner tube secure against loss of air when punctured, by compression imparted to the entire tube by reason of the scientific principle involved in its formation and inflation.

RUBBER PRESERVING CO., Chicago, Illinois. A patented liquid preparation known as "Kepuruber," for preserving rubber goods of all kinds. It overcomes the tendency of rubber goods to deteriorate by oxidation, thus maintaining elasticity, flexibility, resilience and usefulness indefinitely.

THE COMMERCIAL CAR SECTION.

From the point of view of rubber interest, the exhibits at the commercial car section of the show presented few novelties. For the tire manufacturer, however, there were certain exhibits which were notable because they signalize recognition of the factors of economy involved in adapting wheels and tires to conditions of roads, loads, and speeds. From this point of view, injury to the truck and mechanism depends on the selection of tires and how they function. In line with this purpose the increasing use of pneumatic tires, particularly the larger sizes of cord tires, was noticeable, some of these tires being 42 by 9 and 44 by 10 cords of Firestone and Goodyear make, fitted to steel wheels.

THE BRUNSWICK-BALKE-COLLENDER CO., Chicago, Illinois, made an interesting display of their line of solid tires, cord and fabric pneumatics, and inner tubes, all recent developments from the company's extensive model plant at Muskegon, Michigan.

Substitutes for air for filling tire casings, such as the preparation manufactured by the ESSENKAY PRODUCTS CO. and that by the STANDARD FILLER CO. were demonstrated very effectively.

An interesting tire was that exhibited by the EAGLE PUNCTURE PROOF TIRE AND WHEEL CO., of New York City, comprising two side pneumatic cylinders supporting a solid tire tread backed by a shock-absorbing device.

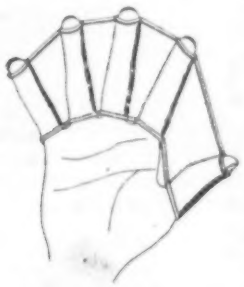
THE SEWELL CUSHION WHEEL CO., Detroit, Michigan, exhibited a wood wheel of composite structure, comprising a spoked center with a zig-zag molded soft-rubber cushion filling the annular space between two wood felloes, the outer one of which carries a standard solid tire.

Other lines of accessories shown were: rubber patches for inner tubes, by the Bull's Eye Rubber Co., Long Island City, New York; Magic Mend for inner tube puncture repairs, by the Eastern Rubber Co., Philadelphia, Pennsylvania.

New Goods and Specialties.

A SWIMMING WEB FOR THE HAND.

THE approach of spring and summer calls out novelties and specialties suitable for use during those seasons. Sports always come in for their share of attention, and now that the restrictions on the manufacture of rubber goods have been removed, no doubt the coming months will show many sports accessories of rubber and rubberized fabrics.



RUBBER SWIMMING WEB.

The swimming device shown here is of sheet rubber such as used for bathing caps, and has a flat web between each of the tubular finger casings, the open ends of which permit the finger-tips to come through. The edges of the web form a reinforcing bead between the finger casings. The web is said to aid materially in increasing a swimmer's power and speed, as well as in keeping him afloat. A patent has recently been granted to the inventor. (Justin A. Clarke, Vincennes, Indiana.)

A NEW GOLF BALL.

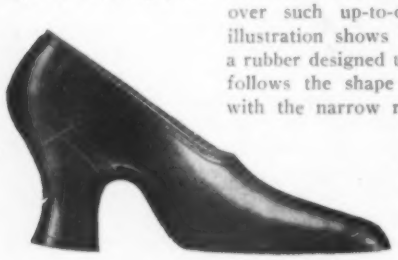
Dealers in sporting goods will be glad to know about this new golf ball, called the "Super-Chick." It is made in two styles, floating and non-floating, in recess and mesh marking. A number stamped on the pole of the ball indicates which kind it is.

"SUPER-CHICK" GOLF BALL.

The particular features of this ball are its extraordinary powers of flight, its steadiness, and its reliability on the putting green. It is so constructed as to remain spherical and is painted with a special paint so applied that the ball will retain its whiteness, even after many rounds. (The North British Rubber Co., Limited, 43 Colborne street, Toronto, Ontario.)

TO FIT HIGH-HEELED FOOTWEAR.

The continued vogue of Louis Quinze heels of extreme type, 12/8 to 18/8 high, has increased the demand for rubbers to fit over such up-to-date footwear. The illustration shows the graceful lines of a rubber designed to fill this demand. It follows the shape of the leather shoe with the narrow recede toe, and is so constructed as to fit snugly the instep and the breast of the heel. The back of the quarter is so modeled as to cling tightly when properly fitted. This rubber is made in black, seal-brown, and taupe colors, and the manufacturers report a large sale throughout the Dominion of Canada. (Columbus Rubber Co. of Montreal, Limited, Montreal, Quebec, Canada.)



"BELL"-SHAPE RUBBER.

A NUTLESS HOSE CLAMP.

While hose clamps look much alike, occasionally one is met with that has some distinguishing feature to recommend it by contrast with other similar devices. The one shown here, called the "Lock-Roll" hose clamp, eliminates the nut so generally used and depends on its special construction for efficiency. It is made of nickel-plated steel in stock sizes from 5/8-inch to 3½-inch by ⅛-inch variations, and requires nothing but an ordinary screw-driver for its adjustment. It is guaranteed by its manufacturers to be non-strippable and vibration-proof, and adaptable in every case where it is absolutely necessary to have a tight connection. (Federal Tin Co., Charles and Barre streets, Baltimore, Maryland.)

"LOCK-ROLL" CLAMP.

A NOVEL INNER TUBE.

One of the novelties of the recent New York Automobile Show was an inner tube of the leak-proof variety, of which an illustration is given herewith. The tube is molded seamless with thick walls, and presents a series of cup-like depressions in staggered arrangement over the entire surface. By this formation thirty per cent more material is contained in the tube walls than would be the case were it molded perfectly circular in cross-section. Under inflation this excess material is effectively compressed by flattening outwardly the inwardly-curved depressions, thus supplying the anti-leak feature. (Shaw Tire Co., Inc., 2 Old South Bldg., Boston, Massachusetts.)

THE "AUTO-SEAL" INNER TUBE.

A NAIL-BRUSH WITH SUCTION CUPS.

The demand for a nail-brush that can be used with only one hand has produced the one shown in the accompanying illustration. It is provided with two good-sized rubber suction cups attached to the back of the brush, by means of which it can be temporarily held in place on the top or side of a wash-basin or set-bowl. The problem of properly cleaning the nails and hand when only one hand can be used has to be experienced to be appreciated. There are many men to-day, as the result of the recent war, who are temporarily or permanently so handicapped. A brush of the kind shown here would be warmly welcomed by such individuals. (S. Maw, Son & Sons, Limited, 7 to 12 Aldersgate street, London, E. C., England.)

"LIMPET" ONE-HAND NAIL-BRUSH.

AN ADJUSTABLE PEDAL COVER.

A new rubber cover for automobile pedals is made in such a way that it is adjustable to all makes of square and oblong pedals and can be adjusted with the fingers. There are no holes to drill and no bolts to come loose. A lock spring and sliding clip are the means by which the cover is attached. It can also be fitted to concave and convex pedals by bending as required. (Rich Manufacturing Co., 1777 Broadway, New York City.)

Patent applied for
"RICO" PEDAL COVER.

NEW TYPE OF RUBBER HEEL.

A rubber heel of new design is composed of two separate sections; one of rubber compound, containing a friction fiber plug, modeled and vulcanized separately from the heel, and one containing an invisible rubber cushion and air space which create a pneumatic effect when the fiber plug presses against the rubber cushion. To the top surface of the heel is applied a special cement which softens in a lamp flame, permitting the ordinary shoemaker to apply the heel by driving six nails. This method of construction makes it possible to use a better grade of rubber in the heel proper, increasing the wearing quality. (Bull's Eye Rubber Co., Long Island City, New York.)

THE BULL'S EYE TWO-SECTION RUBBER HEEL.

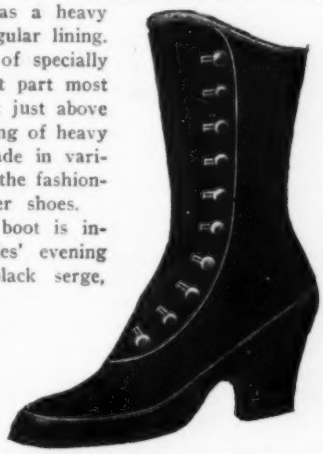
SPECIALTIES IN RUBBER FOOTWEAR.

The prevalence of high heels of the Louis and Cuban types in women's leather footwear has raised some problems which rubber-shoe manufacturers have been forced to solve. That they have been successful in overcoming the difficulties of perfect fit, ease of putting on and off, and proper wear of heels equal to the soles, is acknowledged by retailers and wearers.

THE "TOP NOTCH HIHEEL" RUBBER.

The "Hiheel" rubber shown here is intended to fit the present-day shoe styles. It is made in this "croquet" height and also in the "storm" style, higher in cut over the vamp. Its special advantage over other rubbers is the construction of the heel, which has a heavy duck interlift under the regular lining. The stock of the tread is of specially tough compound, while that part most likely to wrinkle and break just above the tread has an extra piping of heavy rubber. This rubber is made in various shapes to fit snugly all the fashionable lasts of ladies' leather shoes.

The "Top Notch" auto boot is intended to wear over ladies' evening slippers. It is of fine black serge, rubber interlined, with warm, fleecy, wool fabric lining. It has ten buttons with reinforced buttonholes, and durable sole and heel tread for walking when that is preferred. (Beacon Falls Rubber Shoe Co., Beacon Falls, Connecticut.)



"TOP NOTCH" AUTO BOOT.

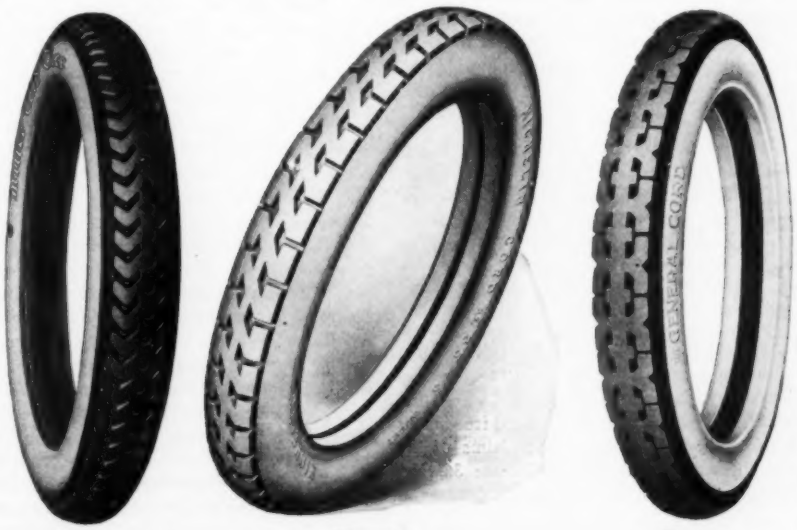
A GROUP OF INTERESTING NEW CORD TIRES.

Among the new cord tires that are coming into more general use every day, the one that combines with its cord construction the already well-known features of other kinds of tires made by the same manufacturer has a distinct advantage, especially from the standpoint of advertising.

The first tire of the group shown here embodies the uniform mileage feature and the "geared-to-the-road" tread which its manufacturer patented for use in its pneumatic tires. The tread has caterpillar teeth, and there are vacuum cups in the running band, both of which combine to give this tire its positive traction, even on wet asphalt. (The Miller Rubber Co., Akron, Ohio.)

The middle tire of the group on this page represents the latest product of its manufacturer. It is called the "Improved Universal" cord tire, and is built by a special process by which each separate cord is impregnated with rubber and not merely coated. The finished tire is therefore more resilient and offers greater resistance to shock and to the action of moisture and air. This tire combines the effective non-skid tread and the broad flat traction surface which are features of the tires of this manufacturer. (Michelin Tire Co., Milltown, New Jersey.

An 8-ply cord tire is third in this group, of 2-cure construction, expanded on a specially constructed air bag instead of the usual steel core. Each



MILLER. MICHELIN. GENERAL.

individual cord is expanded equally and the tire is cured while the cords are stretched to the degree that inflation on the wheel would have stretched them. The tire on the wheel afterward is therefore in the same condition when inflated as it was when cured. (The General Tire & Rubber Co., Akron, Ohio.)

JUDICIAL DECISIONS.

L. P. LARSON, JR., CO. *vs.* WM. WRIGLEY, JR., C. WM. WRIGLEY, JR., CO. *vs.* L. P. LARSON, JR., CO.—Circuit Court of Appeals, Seventh Circuit. July 30, 1918.

The Wrigley company appealed from a final dismissal of its bill against the Larson company in which it alleged unfair competition and the infringement of its trade name "Spearmint."

The Larson company had on the market a chewing gum called Peptomint. The Court decided that Spearmint, being a proper noun, was not suspectible of appropriation as a trade-mark and that even if it were, the Larson trade-mark was not an infringement.

The two brands are put on the market in bundles of 5 sticks each, done up in pink waxed paper bound together so that the ends stick out of a white outer wrapper printed in red and green. However, when the two are placed side by side they are strikingly different. Wrigley secured an injunction against this brand, pending decision by the court.

While under this injunction Larson put on the market his "Wintermint" brand and about seven months afterward Wrigley put his "Doublemint" on the market in a package similar to that used by Larson. After the Wrigley product appeared on the market the sales of "Wintermint" decreased.

The Court of Appeals dismissed the bill against Larson and reversed the dismissal of the counterclaim, ordering an injunction and an accounting. (Federal Reporter, Volume 253, page 914.)

WILLIAM WRIGLEY, JR., CO. *vs.* J. P. LARSON, JR., CO.—Supreme Court of the United States, November 25, 1918.

Petition for a writ of certiorari to the United States Circuit Court of Appeals for the Seventh Circuit denied. (Supreme Court Reporter, Volume 39, page 22.)

CUSTOMS APPRAISER'S DECISIONS.

GUTTA SIAK.—The appeal of Charles H. Demarest (New York) to have gutta siak, which had been classified at 15 per cent. ad valorem under paragraph 385 of the Tariff Act of 1913, admitted free of duty as gutta percha under paragraph 502, was upheld. (Treasury Decisions, Volume 36, No. 3, January 16, 1919.)

CHICLE.—Protests of Wm. Wrigley, Jr., Co., et al., Chicago and New York; of American Chicle Co., Cleveland, Ohio; of American Chicle Co., Detroit, Michigan. The question was whether certain chicle was refined, or advanced, or dutiable as crude under the provisions of paragraph 36 of the Tariff Act of 1913. It was held properly classified as refined, at 20 cents per pound under paragraph 36. (Treasury Decisions, Volume 36, No. 3, January 16, 1919.)

JELUTONG—GUTTA SIAK.—Protests of William F. Mullen et al., and of The Rubber Association of America. Gutta siak and jelutong, which had been classified under paragraph 385 of the Tariff Act of 1913, were claimed to be entitled to free entry under paragraphs 502 and 513, respectively. The claims of the protestants were upheld. (Treasury Decisions, Volume 36, No. 4, January 23, 1919.)

RUBBER BROOCHES.—Protest was made by William H. Stiner & Son, New York City, against the classification as jewelry at 60 per cent ad valorem under paragraph 356, Tariff Act of 1913, of brooches of vulcanized or hard rubber in imitation of jet. The merchandise was held dutiable as manufactures of rubber at 25 per cent under paragraph 369. (Treasury Decisions, Volume 36, No. 5, January 30, 1919.)

GUTTA SIAK—GUTTA PERCHA—CRUDE RUBBER.—Protest was made by George S. Bush & Co., Inc., et al., Seattle, Washington, against the invoicing as non-enumerated articles under paragraph 385, Tariff Act of 1913, of gutta mieauw, gutta habock, gutta hand kang, kampar gutta percha, and bankok gutta percha. The merchandise was held entitled to free entry under pararaphs 502 and 513. (Treasury Decisions, Volume 36, No. 5, January 30, 1919.)

ADJUDICATED PATENTS.

THE UNITED KINGDOM.

IN THE MATTER OF A TRADE-MARK OF THE NEW ATLAS RUBBER CO., LIMITED.—In the High Court of Justice, Chancery Division, October 17-18, 1918.

The New Atlas Rubber Co., Limited, which had registered in Class 40 a trade-mark, No. 357,844, consisting of the word "Talisman," brought action for infringement of the mark against the Rubber Heel Manufacturing Co. The plaintiffs had sold to and the defendants had manufactured for the Maison Talbot, Milan, Italy, rubber heels bearing this trade-mark combined with the Italian firm's initials. The Maison Talbot owned this trade-mark in Italy and the applicants sought to obtain a monopoly in the United Kingdom of business with this foreign firm by registering its trade-mark in The United Kingdom as their own when they had acted only as agent for the owner. The testimony brought out that this effort was part of a systematic plan to "jump" customers' trade-marks and that the applicants had registered or attempted to register four other marks under similar circumstances.

Held, that the respondents (the applicants) had been merely the agents for the foreign firm to stamp goods being made for it with its trade-mark and initials; that there had been a limited use of the mark in The United Kingdom sufficient to disentitle the respondents to register it; that the intention of the respondents had been to prevent anyone else in The Unitd Kingdom competing with them for business for the foreign firm; and that they were not entitled to do that. The trade-mark was ordered to be removed from the register.

PHILLIPS *vs.* HARBRO RUBBER CO.—In the High Court of Justice, Chancery Division, October 23-24, 1918.

Registration in Class 3 was obtained for a design of rubber pads or plates for heels of boots and shoes, consisting of a pad in the shape of a heel and having a plain central depression that might be filled in with leather or other material, and ornamented on the surrounding portion with cross lines. The proprietor brought an action for infringement. The defendants had sold rubber heels of the same form as the registered design, except that the ornamentation was different. It was proved that, from a date prior to that of the registration, the defendants had sold two forms of rubber heels similar in form to the registered design, but having the surrounding portion plain, and, in the one case, a central depression that was plain, and, in the other case, a central portion with a pattern at a slightly lower level than that of the surrounding portion. The defendants contended that, if the parts of the designs were important elements of novelty, the defendants' rubber heels had not those details, and there was no infringement; or, if the parts were not important, the design differed so little from the prior forms of heels that it was not new or original.

Held, that the importance of the parts of a design is dependent on the character of the design; and that there was no substantial novelty or originality in the plaintiffs' combination of old parts. The action was dismissed with costs, and a certificate as to certain of the particulars of objections was given. (The Illustrated Official Journal Supplement, Volume XXV, No. 14.)

Interesting Letters from Our Readers.

HOW BIG IS THE RUBBER BUSINESS?

TO THE EDITOR OF THE INDIA RUBBER WORLD:

DEAR SIR—The present size of the American rubber trade comes up for discussion often and opinions seem to differ. One estimate in 1917 was $900,000,000. About the same time Colonel Colt spoke of the gross business in the United States as being about $800,000,000. Using crude rubber imports as a base and drawing on much manufacturing data, I get the following:

Automobile tires	$250,000,000
Automobile tubes	70,000,000
Solid tires	175,000,000
Boots and shoes	100,000,000
Clothing, auto topping and similar goods	75,000,000
Hard rubber	15,000,000
Rubber cements	5,000,000
Mechanical goods	200,000,000
Druggists' sundries	30,000,000
Rubber insulated wire and insulation	65,000,000
Motor cycle, bicycle tires, etc.	10,000,000
Miscellaneous	30,000,000
Total annual value	$1,025,000,000

Faithfully yours,

New York City. N. W.

SPECIFIC GRAVITY TABLES.

TO THE EDITOR OF THE INDIA RUBBER WORLD:

DEAR SIR—Being in the employ of Messrs Lamprecht & Co. at Oerlikon near Zurich and having been brought up in the rubber trade, it is always with much pleasure that I read your paper, THE INDIA RUBBER WORLD, and follow any discussion about trade matters with much interest.

The tables on the basis of specific gravity 1.00 prompted me to write a few lines about my experience in this matter and the perfection which these tables can be brought up to by using volume prices on the said basis.

Perhaps you may find them also interesting to the readers of THE INDIA RUBBER WORLD.

Yours faithfully,

HERMAN GRIMELMANN.

Wallisellen, Switzerland.

The account of Mr. Grimelmann's experience follows:

VOLUME PRICES AT SPECIFIC GRAVITY 1.00.

With reference to the specific gravity tables in the March and July issues of THE INDIA RUBBER WORLD I beg to say, that in my experience, both as cost clerk and salesman of an india rubber factory for mechanical goods, similar tables have been of the greatest use, both to the man in the office and to the traveler on the road, enabling them to quote the piece price of a certain article, of certain measurements, in a certain quality, at a few minutes' notice. While competing firms made their offers at so many francs per kilogram, the client mostly did not know the specific gravity of the quality offered him and was in consequence not properly fixed as to the cost of the article he had asked for and appreciated my offer when I quoted the price per piece or one hundred pieces. Though the specific gravity was stated, he had no time to reckon out the cost himself and would give the preference to the man who did it for him.

But also, from another point of view, such tables are of great value to the salesman, as he will get to know in this way the real value of his goods compared with other makes. Many times I quoted, for instance, the price for ordinary sheets and was told that a competitor offered at a much lower price and that an order could not be given. Of course no specific weight had been stated and even if it had been mentioned, it had not been taken into consideration by the client. After going fully into the matter and having taken the specific gravity into consideration, my quality was almost always preferred, in spite of its so-called "high" price.

In order to facilitate the use of such tables, they must be kept as plain as possible and the less operations you have to do to get at the result, the fewer mistakes will occur; also the handier the table is in size, the more it will be used.

In this respect the fixing of volume prices for the different qualities, also, on the basis of the specific gravity 1.00 will give much advantage to anyone using weight tables of specific gravity 1.00, as by this means the weight and the price basis are on the same foundation, the specific gravity 1.00, and one simple multiplication will bring you straight to the result.

For instance, instead of multiplying the weight given by the table for a certain dimension, by the specific gravity of the quality chosen, and multiplying the result again with the price of the said quality, I had fixed for each quality the volume price on the basis of the specific gravity 1.00 in my price-book and could therefore save one operation when quoting, for instance:

Quality Number.	Price Per Kilogram for Effective Weight.	Specific Gravity.	Volume Price on the Basis of Specific Gravity 1.00.
1	francs 20.00	1.20	francs 24.00
2	francs 16.00	1.50	francs 24.00
3	francs 16.06	1.25	francs 20.00
4	francs 12.00	1.67	francs 20.00
5	francs 8.00	1.30	francs 10.40
6	francs 5.00	2.08	francs 10.40

To get the most out of your tables, the prices of the different qualities should be fixed in the salesman's price-book on the basis of the one-ounce volume price, as the tables read in ounces. These one-ounce-volume prices would avoid the trouble of a third operation: viz., converting the ounces into pounds for which the prices are commonly fixed.

To give you an example: let us presume the price of quality X with specific gravity 1.50 is 1.60 per pound, effective weight, which is equal to 0.10 per ounce effective weight. The volume price of quality X on the basis of specific gravity 1.00 will then be 2.40 per pound. The one-ounce-volume price will be 0.15 per ounce.

If you wish to know the price of one square yard of sheets ⅛-inch in thickness, in the above stated quality X of specific gravity 1.50 the following operation will be necessary:

Your table shows: ⅛-inch thickness=93.60 ounces per square yard. Volume price for quality X is fixed at 0.15 the ounce. Result, 93.60 by 0.15=14.04 per square yard. While in the ordinary way three operations could not have been avoided, the fixed-volume price reduces same to one single operation and thus saves much time, besides helping to prevent errors.

I had different weight tables at hand, using them daily while quoting to the clients. For instance: Table No. 1, showing the weight at gravity 1.00 of cords, cylinders, etc.; Table No. 2, for tubes; Table No. 3, for balls; Table No. 4, for rings of round profiles; Table No. 5, for round joints of square profiles in all sizes which could possibly occur in the trade.

Tables for square sheets and square strips I had not in use, the reason why I did not miss them lying in the fact that such tables would not have given any advantage at all, the decimal system of weights and measurements enabling a quick result in a simple manner, giving the result not by one foot or one yard, but straight for the length desired.

I must confess that comparing your table with those I had in use, the balance lies much in favor of the latter, the superiority being caused by the great practical use of the French decimal system of weights and measurements, a fact for which, of course, you cannot be held responsible.

For instance the one-ounce volume price would be unnecessary and the one-pound volume price sufficient, if you could fix the

specific gravity tables 1.00 very exactly in pounds instead of ounces, as we can do, for example, with the decimal system of grams and kilograms. For the long and diametrical measurements we have also the advantage in fixing easily if necessary 1-tenth of a millimeter or one-250th part of an inch. Also in writing, how much shorter it is to write 70 mm. than 2=15/32 inches.

I feel sure, that anyone having used the two systems of weights and measurements, will ask himself, how it is possible that this French decimal system of weights and measurements has not yet been accepted universally as standard weights and measurements.

Why can chemists of the whole world have the same formulas for definite quantities, volumes, compositions, while engineers and business men worry themselves with inches, feet, yards and ounces, pounds, quarters and hundredweights instead of adopting the decimal system, based, as its name implies, on the figure 10.

There are, I am sure, many who must feel the same and I quite understand "Effero," author of a series of articles on molds for hard-rubber insulators in the "India Rubber Journal," who simply states: "All dimensions are in millimeters." Is there no remedy possible in the near future?

A QUESTION CONCERNING WASH SALES.

TO THE EDITOR OF THE INDIA RUBBER WORLD:

DEAR SIR—May we ask you as a special favor for information as to a custom in the crude rubber business.

We purchased from an importer ten tons of rubber, to be shipped five tons in January and five tons in March, 1919. We later decided to sell this quantity and resold it to the same importer at a profit, and they sent us what you call a "wash sale."

It was our impression that without exception the custom of the trade on a "wash sale" is that at the date of the wash sale an invoice is rendered for the difference, and this difference is payable net 10 days from date of invoice, as specified in the wash sale. This rubber was an originally contracted shipment from the Far East, five tons each January and March.

The importer now takes the position that he will make his first wash sale or pay us the difference in about two months from January, 1919, contending it will take approximately that time for rubber to come from the Far East and he will make another "wash sale" two months from March.

We will very much appreciate any information you will let us have as to the custom of the trade in such matters.

Yours very truly, EASTERN MANUFACTURER.

AN IMPORTER'S OPINION.

The importer is quite within his rights. The sale was made for January shipment and March shipment. It requires at the least three months to receive the rubber via the coast, and it often takes much longer. It requires at least 60 days to get the rubber from the Far East via the canal. The importer has evidently given the manufacturer the benefit of the quicker trip, when he could easily have claimed that it would come via the Pacific, and which in all probability will.

A resale is the same as making a sale; therefore the time when the rubber would be billed would be the starting point when the account would begin to run for the ten days term of credit. If the rubber was shipped on January 31 it could not be ready for delivery (taking 60 days as a basis) until early April, and the same time would be true of the March shipment. Thus you will see that the importer is treating his friend very fairly.

A "wash" sale is the same, to all intent and purpose, as a regular sale, and the terms would be the same. The importer has got to make an actual delivery to someone, and what he will do is to make a delivery to another buyer and settle with your correspondent as if he had made the sale for the account of the manufacturer.

By figuring this "wash" on the basis of two months the importer is going to lose interest, and his loss of interest will be 30 to 60 days' interest, which in all fairness he could save by not paying the manufacturer until he had waited 10 days from date of the actual delivery. IMPORTER.

REPLETE WITH INFORMATION FOR RUBBER MANUFACTURERS—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

NEW TRADE PUBLICATIONS.

MECHANICAL SUPERINTENDENTS WILL APPRECIATE THE SELECTOmeter, a handy device, in the form of a circular slide-rule for determining the correct size of Francke flexible couplings for any given drive. It is supplied on request to the trade by Smith-Serrell Co., Inc., 90 West street, New York City.

* * *

THE FIRESTONE TIRE & RUBBER CO., AKRON, OHIO, HAS SENT out a handsome catalog of its rubber footwear, which is unique in its illustrations. In addition to showing the various models in the usual half-tone style, many of these models have combined with them a phantom background of some process used in the manufacture, these being grayed, or subdued, so as to embellish, rather than detract from the excellent cuts showing the footwear samples. The book is pocket size, long and narrow, and shows a large variety of goods made by the latest, newest concern to engage in the manufacture of rubber footwear. A fine portrait of President Firestone and a graphic view of the big Akron plant are also included among the illustrations.

* * *

THE CUTLER-HAMMER MANUFACTURING CO., MILWAUKEE, Wisconsin, is distributing a handsome Spanish edition of its 1919 catalog of C-H wiring devices for the Central and South American trade. It illustrates and describes most of the devices shown in the 1919 English catalog, notably feed-through, pendant, and surface snap switches. The Spanish catalog comprises 24 pages, 8 by 10½ inches, and is bound in a striking orange-buff cover. It is uniform in style and arrangement with the 64-page English edition.

* * *

"VOCATIONAL EDUCATION FOR FOREIGN TRADE AND SHIPPING," Bulletin No. 24, issued by the Federal Board for Vocational Education, Washington, D. C., suggests courses of study on the practical aspects of the fundamentals of overseas commerce to be completed within a comparatively short time. It was written by Dr. R. S. MacElwee, Federal agent for commercial education on the above-named board, and a member of the faculty of Columbia University, New York City. This bulletin appeals particularly to business people employed during the day high-school seniors to be trained for junior clerks in the export business, engineers whose technical training must be supplemented by training in the essentials of the routine of foreign commerce, and colleges on a part-time or regular schedule. Business men are especially urged to investigate the courses for the benefit of their employees.

CALENDARS AND SOUVENIRS.

Tyson Bros., Woodbridge, New Jersey, manufacturers of chemicals, rubber substitutes, etc., are sending to the trade an art calendar reproducing C. D. Williams's painting, "The Angel of the Battlefields." The central figure is of a woman in white, representing the composite of women in all walks of life who have helped in winning the war. Around are grouped soldiers of each of the Allied countries, with a United States soldier and sailor, all paying her tribute. The color scheme is blue and white.

E. I. duPont de Nemours & Co., Wilmington, Delaware, have issued a large panel calendar advertising their different products, including chemicals. The calendar itself is printed in clear dark-blue figures of good size on white paper.

The Somerset Rubber Reclaiming Co., New Brunswicy, New Jersey, is sending the trade an attractive brass desk combination including in one piece compartments for pins, stamps, etc., with a hinged cover on the outside of which the company's name is embossed, while inside is a 1919 calendar. Part of the base is a pen-tray, and the whole makes a happy combination and useful souvenir.

News of the American Rubber Industry.

ANNUAL REPORT OF THE B. F. GOODRICH CO.

THE B. F. GOODRICH CO., New York City, has recently issued its annual report for the year ended December 31, 1918, which shows the following figures:

PROFIT AND LOSS ACCOUNT.

Net sales		$123,470,187.67
Manufacturing, selling, and general administration expenses		102,156,330.39
		$21,610,322.71
Miscellaneous income		296,465.43
		$21,610,322.71
Provision for depreciation	$2,428,225.61	
Interest on bills payable, etc.	1,993,031.54	
Reserve to reduce plant additions during war to pre-war values	1,447,540.22	
Reduction of United States Liberty Bonds from cost to market value	104,410.72	
		5,973,208.09
Net profit before providing for final income and war excess profits taxes, carried to surplus account		$15,637,114.62

SURPLUS ACCOUNT.

Balance, January 1, 1918		$20,177,379.01
Net profit for year ended December 1, 1918		15,637,114.62
		$35,814,493.63
9,000 shares 7 per cent cumulative preferred stock at par, redeemed and cancelled during year	$900,000.00	
Additional appropriation for pension fund	100,000.00	
Reduction of treasury stock purchased, cost to par	9,506.25	
7 per cent dividend on preferred stock for year	1,785,000.00	
4 per cent dividend on common stock, paid during 1918	2,400,000.00	
		5,194,506.25
		$30,619,987.38
Applied in redemption of preferred stock		4,500,000.00
		$35,119,987.38

The increase in the net sales for the year amounted to 41 per cent over the amount for 1917.

DIVIDENDS.

Ajax Rubber Co., Inc., New York City, has declared its quarterly dividend of $1.50 per share, payable March 15 on stock of record February 28, 1919.

The Amazon Rubber Co., Akron, Ohio, at its annual meeting, declared an extra dividend of twelve and one-half per cent, payable in common stock.

The Brunswick-Balke-Collender Co., Chicago, Illinois, declared a quarterly dividend of one and three-quarters per cent on its common stock, payable February 15 to stock of record February 4, 1919. The last previous dividend was paid on May 15, 1918, at the rate of one and one-half per cent, none having been paid since until the present one because of war conditions.

The B. F. Goodrich Co., Akron, Ohio, has declared quarterly dividends of one per cent on its common stock, payable May 15 on stock of record May 5, and of one and three-quarters per cent on its preferred stock, payable April and July 1 to stock of record March 21 and June 20, 1919, respectively.

The Pennsylvania Rubber Co., Jeannette, Pennsylvania, at its recent annual meeting declared a quarterly dividend of one and three-quarters and one and one-half per cent, respectively, on its preferred and common stock.

The Plymouth Rubber Co., Canton, Massachusetts, has declared its regular quarterly dividend of one and three-quarters per cent on its preferred stock, payable March 1 to stock of record February 21, 1919.

The Swinehart Tire & Rubber Co., Akron, Ohio, has declared a dividend of two per cent in cash, payable April 15 to common stock of record March 31, and an extra dividend of ten per cent in preferred stock, payable March 5 to stock of record February 20, the latter dividend being in lieu of those not paid between October 1, 1917, and December 31, 1918.

NATICNAL ASSOCIATION OF WASTE MATERIAL DEALERS.

David Feinburg, Lionel D. Waixel and George B. Smitheman, the Nominating Committee of the National Association of Waste Material Dealers, have made the following nominations, to be acted on at the annual meeting March 19:

Officers: F. W. Reidenbach, president; James Rosenberg, first vice-president; Edward A. Stone, second vice-president; Henry Lissberger, third vice-president; Ivan Reitler, fourth vice-president; Paul H. Loewenthal, fifth vice-president; M. B. Speer, sixth vice-president; David Feinburg, treasurer.

Directors for two years: George B. Smitheman, Julius Rosenberg, Herman Muehlstein and Herman Goldstein.

Independent nominations can be made on petition of 25 members, such petitions to be filed with the secretary not later than 20 days preceding the annual meeting.

RUBBER COMPANY SHARE QUOTATIONS.

QUOTATIONS BEFORE AND DURING THE WAR. PRICE AND YIELD AS OF DEC. 31, 1918.

Corporation.	Security.	Par Value.	1913. High.	1913. Low.	1914. High.	1914. Low.	1915. High.	1915. Low.	1916. High.	1916. Low.	1917. High.	1917. Low.	1918. High.	1918. Low.	1918. Last Sale.	1918. Dividend, Per Cent.	1918. Yield, Per Cent.
Ajax Rubber Co., Inc.	Common	$50	...	...	...	...	71⅛	67	89⅛	63	80	45	72¼	49	67	6	4.45
The Fisk Rubber Co.	Common	100	...	...	...	...	126	60	170	95	75½	40	75	49	72	None	...
The Fisk Rubber Co.	1st preferred	100	...	...	...	...	...	...	...	...	112½	90	103	97	101	7	6.93
The Fisk Rubber Co.	2nd preferred	100	...	...	...	...	...	...	...	...	95	65	90	60	90	7	7.77
The Fisk Rubber Co.	1st convertible preferred	100	...	...	...	...	...	...	...	...	...	...	100	90	95	7	7.37
Firestone Tire & Rubber Co.	Common[1]	10	360	222½	305½	247	804½	365	1700	730	150½	97	150	89¼	140½	50	3.56
Firestone Tire & Rubber Co.	Preferred	100	...	...	...	...	...	...	107¾	107	109	97	101	92	99½	6	6.03
The B. F. Goodrich Co.	Common	100	68	14	28⅞	19⅝	80¼	24½	80	57⅛	61¼	32¼	59⅞	38	56½	4	6.56
The B. F. Goodrich Co.	Preferred	100	105¼	73⅜	97	79⅜	114½	95	116¼	110	112	91⅜	104	96	104	7	6.73
Kelly-Springfield Tire Co.	Common[2]	25	42	40	309	69	78½	72½	85¼	56	64½	36⅞	72	41	69⅜	16	5.77
Kelly-Springfield Tire Co.	Preferred	100	...	...	145[3]	72	98½	76	101	95	93	75	90¼	76	90	6	6.67
Lee Rubber & Tire Co.	Common	None	...	...	...	...	50¼	46	56½	25⅛	30	10¾	24	12	21½	None	...
The Miller Rubber Co.	Common	100	202	135	165	115	279½	157	355	204½	262½	112	160	99¼	145	8	5.52
The Miller Rubber Co.	Preferred	100	...	...	101	100	112¾	101¾	117½	104½	107	95	100¼	90	99	7	7.07
Portage Rubber Co.	Common	100	...	...	...	...	80¼	34½	183½	62½	185	120	161	100½	153¼	12	7.83
Portage Rubber Co.	Preferred	100	...	...	...	...	...	...	...	...	90½	90½	97	87¼	95½	7	7.33
Swinehart Tire & Rubber Co.	Common	100	91	68	85	60	96½	69	110	79	85	19⅜	56	26¾	56	None	...
United States Rubber Co.	Common	100	69½	51	63	44½	74¾	44	70¾	47¾	67	45	80½	51	80¼	None	...
United States Rubber Co.	Preferred	100	109¾	98	104¾	95⅛	110	101⅜	115¼	106⅛	114¾	91	110	95	110	8	7.27

[1]Par value $100 prior to 1917. [2]Par value $100 prior to 1915. [3]Including 78½ per cent paid on accumulated dividends.

Among the minor rubber companies the high and low prices for 1918 were as follows: Empire Rubber & Tire Co., common stock, par $10, high 3¼, low 2⅝; preferred, $100 par, high 70, low 40. International Rubber Co., high 15¼, low 8. Keystone Tire & Rubber Co., common, par $10, high 46½, low 11¾; preferred, high 17⅞, low 17. Pacific Tire & Rubber Co., high 48, low 47. Perfection Tire & Rubber Co., high $1.00, low 32 cents.

(*Compiled for* THE INDIA RUBBER WORLD *by John Burnham & Co., 115 Broadway, New York City, and 41 South La Salle street, Chicago.*)

ONE OF THE REVERE PIONEERS.

A STEADY and unbroken service of nearly half a century with one concern is something of which one may well be proud. Such is the record of William H. Gleason, whose resignation from the offices of secretary and treasurer of the Revere Rubber Co., Chelsea, Massachusetts, was recently announced, after a continuous service of over 45 years.

WILLIAM H. GLEASON.

William Henry Gleason was born and educated in Boston, and at the age of 15 entered a law office in that city. Later he was employed successively in the dry goods and the woolen goods businesses. On December 1, 1873, he entered the employ of the Boston Elastic Fabric Co., Chelsea, Massachusetts.

The company added mechanical rubber goods to its output, and the veteran Charles McBurney became president. In 1883 the company was reorganized and Henry C. Morse was elected treasurer and general manager and the name of the company was changed to Revere Rubber Co.

Beginning as bookkeeper Mr. Gleason soon became assistant treasurer, then treasurer, and later both secretary and treasurer of the company. Connected with the company were E. S. Converse, Franklin L. Pitcher, George H. Hood, and George A. Alden, all pioneers in the New England rubber business.

Thus it happened that Mr. Gleason, intimately associated with the then leaders of the trade, was a factor in the history making of that period. He was also one of the founders of the New England Rubber Club, now The Rubber Association of America, held various offices and did much to make the club a success. Mr. Gleason has two characteristics that were of extreme value in the positions that he held, unusual financial ability and a faculty for turning off work that is phenomenal. He is never behind, in fact it is said of him that he usually does things "the day before."

Mr. Gleason remains as treasurer of the Associated Industries of Massachusetts, an organization of business men having 1,100 members, in which he has long been active. An alert, shrewd, capable Yankee, his many friends wish for him a long, happy continuation of his very useful career.

H. W. JOHNS-MANVILLE CO. TO BUILD IN ILLINOIS.

The H. W. Johns-Manville Co., Madison avenue and 41st street, New York City, manufacturer of asbestos goods and machinery packing, has purchased from several different owners a tract of land containing approximately 225 acres north of and adjoining Waukegan, Illinois, between the Chicago and Northwestern railroad tracks and Lake Michigan. As soon as conditions allow, a $3,000,000 plant to duplicate the one already located at Manville, New Jersey, will be built. It will cover 1,250,000 square feet of floor space and employ between 2,500 and 3,000 persons. Eight parcels of land were included.

BOSTON BANK TO ESTABLISH FAR EASTERN CONNECTIONS.

C. F. Weed, vice-president of The First National Bank, and D. A. de Menocal, vice-president of The First National Corp., Boston, Massachusetts, have been sent by the bank to establish further foreign banking connections in Australia, China and Japan. They expect to be away about four months. Boston merchants have shown keen interest in the trip and have submitted numerous matters for inquiry.

TRADE NOTES.

The Pennsylvania Rubber Co., Jeannette, Pennsylvania, at its annual meeting elected the following directors and officers: directors—H. Wilfred DuPuy, president-treasurer; Charles M. DuPuy, vice-president; George W. Shiveley, secretary; Herbert DuPuy, chairman; Seneca G. Lewis, vice-president-general manager; other officers—George W. Daum, second vice-president in charge of production; A. H. Price, second vice-president in charge of sales development; C. G. Morrill, assistant treasurer; H. H. Salmon, purchasing agent; James Q. Goudie, general sales director; executive committee—Messrs. H. Wilfred and Charles M. DuPuy, Lewis Shiveley, Morrill, Salmon, and Price.

The Kelly-Springfield Tire Co., New York City, has announced the following elections and appointments: vice-presidents—F. A. Seaman, secretary; C. A. Brown; Otis R. Cook, formerly general sales manager, and a director; Maurice Switzer, advertising manager; other appointments—W. H. Bell, former Chicago district manager, appointed manager of motor truck tire division of general sales department, succeeded by H. H. Grobe, former manager of Baltimore branch; Capt. S. P. Landers, recently discharged from service, manager of branch, Baltimore, Maryland; Capt. John Baldwin, former Washington representative, now with motor tire division of general sales office; H. B. Joseph, former assistant advertising manager, now manager of outdoor display.

The Globe Tire Manufacturing Co., New York City, held its annual stockholders' meeting at the office of the company, 1851 Broadway, on February 4, 1919.

The Traveler Tire and Rubber Co., 819 North Broad street, Philadelphia, Pennsylvania, has purchased a factory site at Bethlehem, in that state, where it expects to begin building early in the summer. Specifications for the building are now being prepared. The company has an authorized capital of $1,000,000 common stock and $350,000 preferred stock. The officers are as follows: Guy de la Rigaudiere, president; Victor Durand, Jr., first vice-president; G. J. P. Raub, second vice-president; and E. E. Pollard, secretary and treasurer. The company will manufacture Traveler tires.

The United States Rubber Co., New York City, will exhibit at the Lyons fair to be held in Lyons, France, March 1-15, its full line of rubber tires, rubber and canvas footwear, belting, hose, insulated wire, gloves, sporting goods, druggists' sundries, and other rubber goods.

The Thermoid Rubber Co., New York City, at a meeting of its salesmen from the Boston, Philadelphia, and New York offices on January 29, discussed general trade conditions. The meeting was followed by a dinner at the New York Athletic Club, at which the bill of fare was printed on a salesman's expense report blank. The menu included "6,000-mile chicken," "Thermoid-Hardy peas," "Outlet ice cream," etc., to say nothing about "New York Branch cocktail" and "Boston Branch oysters." The company money on hand was "plenty" and directions regarding expense check read: "Hold! Do not need it."

The American Tire Filler Industry, Inc., was recently organized in the West, with offices at 220 West Superior street, Chicago, Illinois, and the following officers who are also directors: president, Franc D. Mayer, The Essenkay Products Co., Chicago, Illinois; first vice-president, Frank A. Hager, Universal Tire Filler Co., Portland, Oregon; second vice-president, Lee W. Lockwood, Dahl Punctureless Filler & Rim Co., Minneapolis, Minnesota; third vice-president, W. W. Major, National Rubber Filler Co., Midlothian, Texas; secretary, C. P. Umstot, Peerless Tire Filler Co., Chicago, Illinois; treasurer, L. G. Harris, Wolverine Tire Cushion & Accessory Co., Detroit, Michigan; J. Wolff, National Synthetic Tire & Rubber Co., New York City; and C. G. Schwarz, Panama Rubber & Equip-

ment Co., St. Louis, Missouri. The object of the organization is to standardize and perfect tire fillers, and it is incorporated without capital and not for profit.

E. I. du Pont de Nemours & Co., Inc., Wilmington, Delaware, will hold the annual meeting of its stockholders at the office of the company, 1007 Market street, on March 10, at noon, for the purpose of electing directors, receiving and acting on reports, etc.

Cameron Machine Co., 57 Poplar street, Brooklyn, New York, has increased its capital from 500 shares common and 150 preferred to 3,000 of each, making a total capitalization of $600,000. Both classes of stock have been exchanged, share for share, for the new issue, of which 2,500 common and 850 preferred remain in the treasury and 2,000 of the new preferred are offered for sale.

The business conducted by William H. Stiles, crude rubber importer, at 79-85 Wall street, New York City, will hereafter be known as William H. Stiles & Co., Messrs. Lynn D. Stiles and Gordon Milne having been admitted to partnership.

H. Muehlstein & Co., dealers in scrap rubber, are now located at 147 East 125th street, New York City, their offices and one of five warehouse buildings having been destroyed by fire early in February. The new premises were formerly occupied by the Chatham & Phenix National Bank and provide facilities for the present lessee.

The Cotton Duck Association held its annual meeting at the Hotel Astor, New York City, early in February, and elected the following officers: William H. Wellington, president; Spencer Turner, vice-president; Summerfield Baldwin, Jr., treasurer; and C. S. Green, secretary. The executive committee includes the above officers and in addition S. Parker Bremer, F. Coit Johnson, William L. Barrell, and Robert P. Hooper

Innis & Co., importers of crude rubber, etc., announce the removal of their general offices from 10 Herbert street to 132-4 Front street, New York City.

W. E. Byles, crude rubber and eastern produce broker, has moved to 140-142 Pearl street, New York City.

SCHAEFFER & BUDENBERG SALES AGENCIES.

The steady growth of the sales organization of Schaeffer & Budenberg, Brooklyn, New York, is indicated by the addition of Tulsa, Oklahoma, to their list of selling offices. This branch will carry a full stock of the firm's well known instruments, particularly those widely used in the refining industry. T. C. Eales has been appointed local manager.

Schaeffer & Budenberg now have direct branches in Chicago, Pittsburgh, Detroit, Philadelphia and San Francisco, and the following sales agencies: Toronto, Ontario, Milton & Prentiss; Greenville, South Carolina, L. W. Cuddy; Salt Lake City, Utah, F. C. Richmond Machinery Co.; Los Angeles, California, Adolf Frese Optical Co.; Seattle, Washington, Steam Supply & Rubber Co.

RUBBER SECTION OF THE AMERICAN CHEMICAL SOCIETY.

The plan to make the Rubber Section of the American Chemical Society a division of that society is beginning to take shape. By-laws similar to those of the other divisions have been drawn up for consideration by the executive committee, and the whole matter will be presented to the council of the American Chemical Society at the meeting in Buffalo in April.

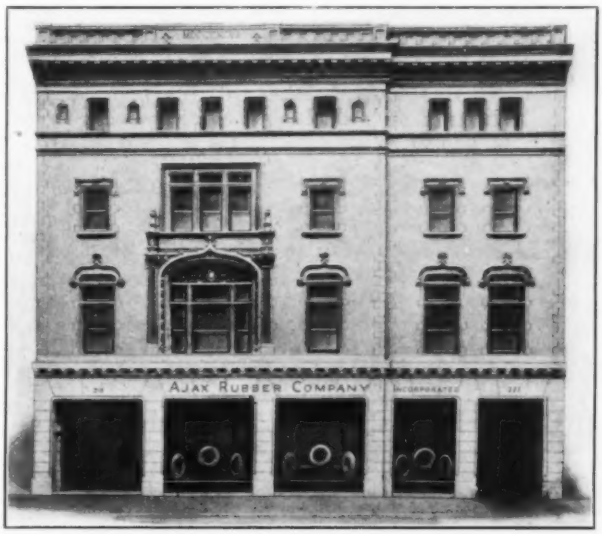
It seems inadvisable to hold a meeting of the Rubber Section at that time, but preparations for the annual fall meeting are already in the making. The executive committee realizes fully that the success of this and every meeting depends upon the work of the rubber chemists of the country; that it is conditional upon their opportunities for original work in their special lines; and that it is sustained by the freedom with which the various problems confronting all are discussed. Secretary Arnold H. Smith is therefore getting in touch with the rubber chemists of the country in an effort to have every laboratory head at the next meeting, which it is desired to make an especially active and interesting one.

The members of the executive committee are: John B. Tuttle, chairman; Dr. David Spence, George Oenslager, L. E. Weber, H. E. Simmons, L. H. Plumb and A. H. Smith, secretary, Bureau of Standards, Washington, D. C.

The jar-ring committee of the Rubber Section is working in active cooperation with the Department of Agriculture and it is expected that some announcement concerning its activities will be made in the near future.

NEW HOME OF AJAX RUBBER CO., INC.

For some months the building at 218-222 West 57th street, New York City, has been undergoing remodeling to adapt it for the use of its new tenant, Ajax Rubber Co., Inc. The building is four stories high and offers approximately twice the area the company had in its former quarters.



AJAX RUBBER CO.'S NEW QUARTERS.

The first floor of the new premises is devoted to the New York selling branch, while on the eastern and western ends, respectively, are a vestibuled entrance to the executive offices and a wide driveway. The offices of H. L. McClaren, president, Horace De Lisser, chairman of the board of directors, and of Stuart Webster, treasurer, are on the second floor, as well as the meeting-room of the board of directors and the credit, collection, and accounting departments. The third floor is occupied by the advertising department and the officers of the export, sundries, and traffic departments, branch house managers and sales correspondents. The sales conference room is also on this floor and the office of Fred E. Dayton, secretary and general sales manager of the company.

The exterior of the building has been refaced and the interior remodeled to meet the requirements of the company.

ALLEN MACHINE CO. OCCUPIES NEW PLANT.

The Allen Machine Co., Erie, Pennsylvania, is now installed in its recently acquired plant, which is one of the most modern in the country. Its facilities include a foundry, with two cupolas, machine tools for handling work up to 16 feet in diameter, 30-ton traveling cranes and motor-driven roll-lathes and grinders.

NEW INCORPORATIONS.

Aconite Controls Corp., January 27, 1919 (Delaware), $2,500,000. M. L. Horty, M. C. Kelly, S. L. Mackey—all of Wilmington, Delaware. Principal office with Delaware Charter Guarantee & Trust Co. Du Pont Building, Wilmington, Delaware. To deal in, produce, and manufacture goods, merchandise, and clothing, of which rubber is a component part.

Aconite Tire & Rubber Co., January 9, 1919 (New Jersey), $125,000. I. Eisenberg, E. T. Adam, A. T. Vanderbilt—all of 810 Broad street, Newark, New Jersey. Principal office, 115 South Warren street, Trenton, New Jersey. Agent in charge, J. M. Weaver. To manufacture, purchase, sell, import, export and deal in automobile tires, etc.

Arentox Co., October 8, 1918 (Delaware), authorized capital, 1,000 shares of stock without nominal or par value. C. L. Rimlinger, M. M. Clancy, F. A. Armstrong—all of Wilmington, Delaware. Principal office with Corporation Trust Co. of America, Du Pont Building, Wilmington, Delaware. To manufacture and deal in gutta percha, etc.

Associated Rubber Interests, Inc., January 31, 1919 (New York), $10,000. C. Byrd, 51 Delap street, Queens, H. C. Sleicher, 76 Pearl street, T. M. Healy, 32 Liberty street, both of New York City—all in New York. To deal in rubber products.

Automatic Safety Tire Valve Corp., The, January 28, 1919 (New York), $10,000. S. X. Newman, 10 Stone street, Yonkers, G. H. Crossman, Hotel Prince George, New York City, C. R. Tock, 487 Sanford avenue, Flushing—all in New York. To manufacture auto tire valves, etc.

Bayonne Tire & Rubber Co., Inc., February 6, 1919 (New York), $2,000. S. Bernheim, C. A. Weldon, A. Hirsch—all of 35 Nassau street, New York City. To manufacture tires.

Bridgeport Tire & Rubber Co., Inc., February 1, 1919 (New York), $2,000. H. S Hartstein, S. Bernheim, C. A. Weldon—all of 35 Nassau street, New York City. To manufacture tires.

Central New York Tire & Tube Co., Inc., February 1, 1919 (New York), $20,000. H. S. Hartstein, S. Bernheim, C. A. Weldon—all of 35 Nassau street, New York City. To manufacture tires.

City Rubber Co., January 18, 1919 (Massachusetts), $25,000. C. B. Delano, 52 Ivy street, G. P. Duhamel, 5 Boynton street—both of Boston; J. Bradley, 24 Willow Court, Dorchester—all in Massachusetts. Principal office, Boston, Massachusetts. To manufacture and deal in automobiles and motors of all kinds and all parts and appliances used in connection therewith.

Columbus Tire & Rubber Co., Inc., February 1, 1919 (New York), $5,000. H. S. Hartstein, S. Bernheim, C. A. Weldon—all of 35 Nassau street, New York City. To manufacture tires.

Du Pont de Nemours Export Co., E. I., December 12, 1918 (Delaware), $100,000. W. S. Gavan, C. R. Mudge, A. M. Gorman—all of Wilmington, Delaware. Delaware agent, A. I. du Pont, 1007 Market street, Wilmington, Delaware. To do a general export business, and, among other things, handle products of Du Pont Fabrikoid Co., Fairfield, Connecticut.

Eckrode Rubber Co., February 6, 1919 (New Jersey), $100,000. C. E. Eckrode, Highland Park, E. F. Hensler, 833 South 13th street, G. A. Hensler, 815 South 11th street—both of Newark—all in New Jersey. Principal office, 118-122 Adams street, Newark, New Jersey. Agent in charge, C. E. Eckrode. To make, purchase, and sell rubber boots, shoes, tires and tubes.

Erie Tire & Rubber Co., Inc., February 17, 1919 (New York), $5,000. C. A. Weldon, H. S. Hartstein, A. Hirsch—all of 35 Nassau street, New York City. To manufacture tires.

Essex Tire & Rubber Co., Inc., February 11, 1919 (New York), $4,000. C. A. Weldon, H. S. Hartstein, A. Hirsch—all of 35 Nassau street, New York City. To manufacture tires.

Excello Rubber Heel Mfg. Co., January 9, 1919 (Delaware), $300,000. F. L., M. E., and L. F. Mettler—all of Wilmington, Delaware. Principal office, 832 Market street, Wilmington, Delaware. To manufacture and sell rubber heels, soles, shoes, etc.

Fair Tire & Rubber Co., Inc., February 17, 1919 (New York), $5,000. C. A. Weldon, H. S. Hartstein, A. Hirsch—all of 35 Nassau street, New York City. To manufacture tires.

Fresno Tire Sales Co., Inc., February 10, 1919 (New York), $5,000. C. A. Weldon, H. S. Hartstein, A. Hirsch—all of 35 Nassau street, New York City. To manufacture tires.

Hague Co., F. B., February 14, 1919 (New Jersey), $125,000. F. B. and S. E. Hague, W. E. Turton—all of Newark, New Jersey. Principal office, 810 Broad street, Newark, New Jersey. Agent in charge, W. E. Turton. To manufacture, buy, sell, import, export, and generally deal in automobile tires, etc.

Horseshoe Rubber Co., January 8, 1919 (Illinois), $25,000. T. H. Spencer, C. Wright, J. B. Brugler. Principal office, 2700 South Michigan avenue, Chicago, Illinois. To manufacture and deal in automobile tires and tire accessories.

Kelley Tire & Rubber Co., January 7, 1919 (Delaware), $1,000,000. E. J. Kelley, C. H. Bortell, Jr.,—both of New Haven, Connecticut; H. F. Gilg, Wilmington, Delaware. Principal office with Delaware Registration Trust Co., 900 Market street, Wilmington, Delaware. To manufacture and deal in tires for automobiles, bicycles, etc.

Laconia Tire Co., December 31, 1918 (New Hampshire), $2,000. S. and F. Malanowski, O. L. Young, M. C. Gilman—all of Laconia, New Hampshire. To buy, sell, and deal in automobile supplies.

Missouri Tire & Rubber Co., Inc., February 4, 1919 (New York), $5,000. C. A. Weldon, A. Hirsch, S. Bernheim—all of 35 Nassau street, New York City. To manufacture tires.

Modern Tire Co., Inc., January 27, 1919 (New York), $2,500. N. Chaitowitz, 309 West 50th street, H. Gluschak, 646 East 13th street, H. Edelson, 56 East 101st street—all of New York City.

Newark Tire & Rubber Co., Inc., February 6, 1919 (New York), $4,000. S. Bernheim, C. A. Weldon, A. Hirsch—35 Nassau street, New York City. To manufacture tires.

New Tread Tire Co., The, January 8, 1919 (Ohio), $100,000. F. H. Groves, president; S. W. Tidd, ex-vice-president, C. U. Calvin, secretary and treasurer; E. P. Altenburg, general manager—all of Columbiana, Ohio. Principal office, Columbiana, Ohio. To rebuild and retread automobile tires.

O'Rourke Tire & Battery Corp., February 17, 1919 (New York), $500. John, and John J., and C. O'Rourke—all of 348 91st street, Brooklyn, New York. Tire and battery service station.

Palace Tire & Rubber Co., Inc., February 17, 1919 (New York), $3,000. C. A. Weldon, H. S. Hartstein, A. Hirsch—35 Nassau street, New York City. To manufacture tires.

Paterson Tire & Rubber Co., Inc., January 28, 1919 (New York), $2,000. C. A. Weldon, H. S. Hartstein, A. Hirsch—all of 35 Nassau street, New York City. To manufacture tires.

Peoples Auto Tire & Supply Co., February 10, 1919 (New Jersey), $50,000. C. H. Reed, 40 Seymour avenue, G. S. Staib, 175 Chadwick avenue, L. G. Miller, 616 Bergen street—all of Newark, New Jersey. Principal office, 435 Clinton avenue, Newark, New Jersey. Agent in charge, L. G. Miller. To conduct a general automobile supply store.

Plaza Tire & Rubber Co., Inc., January 24, 1919 (New York), $3,000. A. L. Dasburg, president; W. L. Lissberger, vice-president; J. Jacobs, secretary and treasurer. Address, 382 Jackson avenue, Long Island City, New York. To manufacture tires.

Reading Tire & Rubber Co., Inc., February 4, 1919 (New York), $4,000. C. A. Weldon, A. Hirsch, S. Bernheim—all of 35 Nassau street, New York City. To manufacture tires.

Super Tire & Rubber Co., Inc., February 10, 1919 (New York), $10,000. A. Paillot, Woodside; E. A. Ehrhardt, Elmhurst; W. Haupt, 325 East 51st street, New York City—all in New York. To manufacture tires.

Timpany Rubber Co., Inc., January 8, 1919 (Connecticut), $20,000. W. A. Timpany, president; O. W. Olsen, secretary and treasurer; M. C. Timpany—all of 504 Bank street (principal office), New London, Connecticut. To buy and sell tires and automobile accessories.

Traveler Rubber Co. of Bethlehem, U. S. A., January 24, 1919 (Delaware), $1,350,000. E. E. Pollard, J. E. Green—both of Philadelphia, Pennsylvania; S. D. Townsend, Jr., Wilmington, Delaware. Principal office with S. D. Townsend, Jr., 927 Market street, Wilmington, Delaware. To manufacture and deal in tires for automobiles, bicycles, etc.

Triangle Rubber Co., February 12, 1919 (Delaware), $100,000. J. Whan, H. R. Shaffer, C. K. Detimore—all of Sebring, Ohio. Principal office with Capital Trust Co. of Delaware. To manufacture inner tubes, tires, and other rubber accessories.

Union Raincoat Co., Inc., January 31, 1919 (New York), $20,000. M. Volansky, 1876 Marmion avenue; S. Volansky, 1539 Minford place—both of Bronx; R. Melnick, 1735 Benson avenue, Brooklyn—all in New York. To manufacture rubber apparel.

Williamsburg Tire & Rubber Co., Inc., February 17, 1919 (New York), $3,000. C. A. Weldon, H. S. Hartstein, A. Hirsch—all of 35 Nassau street, New York City. To manufacture tires.

World Rubber Products Co., Inc., February 10, 1919 (New York), $1,000. I. Spielberger, 1237 Hoe avenue; C. H. Herbst, 1071 West Farms road—both of Bronx; I. Cohen, 155 Rose street, Brooklyn—all of New York. To manufacture rubber products.

Yonkers Tire & Rubber Co., Inc., February 3, 1919 (New York), $3,000. H. S. Hartstein, C. A. Weldon, S. S. Bernheim—all of 35 Nassau street, New York City. To manufacture tires.

TWO NEW DU PONT SUBSIDIARIES.

Two new companies have been recently incorporated to take over the chemical and export business of the Du Pont organization. These are: Du Pont Chemical Co., Inc., Wilmington, Delaware, which will manufacture and deal in chemicals, oils, paints, etc., and the E. I. du Pont de Nemours Export Co., Wilmington, Delaware, which will take over foreign business. The officers of the export organization are: F. W. Pickard, president, in charge of sales; Walter S. Gaven, vice-president and director of sales; F. D. Brown, treasurer; and Alexis I. du Pont, secretary. The directors, in addition to the officers, include F. C. Peters, C. L. Petze, J. A. Burckel and J. E. Hatt.

DOMINION RUBBER SYSTEM INCORPORATES.

The Canadian Consolidated Rubber Co., Limited, Montreal, Quebec, Canada, in order to separate its sales and distribution from its manufacturing department, has incorporated seven provincial companies to handle sales and distribution in Canada, the name in each case being "Dominion Rubber System, Limited," with the name of the province in parenthesis inserted before the word "Limited."

Each company takes over the leases, property, fixtures, stock on hand, etc., at actual valuation, while its policy will be determined by a board of directors made up of members of the head office executive force and the manager of the provincial company.

The officers and directors of the parent company are: T. H. Rieder, president; R. E. Jamieson, vice-president; H. Wellein, A. E. Massie, H. R. Nixon, J. A. Martin, J. M. S. Carroll and W. A. Eden.

The offices, managers, and secretary-treasurers of the provincial companies are as follows, respectively:

Maritime—St. John, New Brunswick; W. R. Stewart, A. R. Hannah.

Quebec—Montreal; George Bergeron, J. Myles.

Ontario—Toronto; J. A. Connor, H. E. Dane.

Manitoba—Winnipeg; Charles Holden, R. W. Pollock.

Saskatchewan—Regina; G. E. Wight, H. A. Wells.

Alberta—Calgary; A. C. McGiverin, G. E. Healey.

Pacific—Vancouver, British Columbia; W. A. Allan, J. M. Doyle.

PERSONAL MENTION.

Samuel P. Colt, chairman of the board of directors of the United States Rubber Co., New York City, spent the month of February in California.

Guy E. Tripp, chairman of the board of directors of the Westinghouse Electric & Manufacturing Co., New York City, sailed for Europe early in February.

R. Y. Cooke, who has been connected with the Racine Rubber Co., since 1912, has been promoted to the position of secretary and general manager of the company at Racine, Wisconsin, succeeding the late Mr. Severance. He has also been elected a director of the Ajax Rubber Co., Inc., New York City, of which the Racine company is a subsidiary.

Louis Rosenberg has been appointed director of advertising and sales for the Keystone Tire & Rubber Co., Inc., New York City.

A. P. Gormully has been placed in charge of the export business of the Ajax Rubber Co., Inc., New York City.

F. E. Kaeppel is now representing the mechanical department of the Federal Rubber Co., Cudahy, Wisconsin, among the jobbers of Chicago and the Middle West. He was formerly with the United States Rubber Co. and for seven years was connected with the Chicago plant of the Mechanical Rubber Co., serving the jobbing trade.

A. C. Eggers, manager of the crude rubber department of the Mercantile Bank of the Americas, Inc., 38 Pine street, New York City, was formerly connected with Eggers Bros. & Co., crude rubber dealers, and more recently was production expert in the Signal Corps of the Army.

Mark L. Smith has identified himself as a salesman with Stresen-Reuter & Hancock, Inc., manufacturer of and dealer in colors, minerals, and chemicals for the rubber and allied trades, Chicago, Illinois. He was formerly with the Commercial Chemical Co. and is well acquainted with the chemical trade.

R. J. CALDWELL HONORED BY LUNCHEON.

R. J. Caldwell of R. J. Caldwell Co., Inc., manufacturer of cotton duck and tire fabrics, New York City, was recently appointed a member of the United States Industrial and Economic Commission and is now in Europe making surveys of the industrial situation. On January 24, the day preceding the sailing of the commission, Mr. Caldwell was the guest of honor at a luncheon at the Lawyers' Club, attended by many men prominent in public life. The opening address was made by Mr. Caldwell, who dealt with industrial conditions, especially with reference to the more equitable treatment of labor. He was particularly emphatic in urging that adequate provision be made to retain workers in their employment in times of stress.

R. J. CALDWELL.

Among the other speakers, all of whom alluded in complimentary vein to the philanthropic and useful work accomplished by Mr. Caldwell in the promotion of better working and living conditions for industrial employes, were W. Bourke Cochran, John B. Stanchfield, George Gordon Battle and Simeon D. Fess, Congressman from Ohio. John Morgan, vice-president and treasurer of the McGraw Tire & Rubber Co., East Palestine, Ohio, and a recently appointed director of The Rubber Association of America, represented the rubber trade.

WEBSTER NORRIS, S. B.

DURING the early eighties, immediately following his graduation from the Massachusetts Institute of Technology, Webster Norris was an analyst in steel and sugar-refining industries. A few years later, as chief chemist of the Chicago, Milwaukee, and St. Paul Railway Co., his attention was directed to the technology of rubber. Personal investigation revealed the need of chemical standardization of the materials, processes and products of rubber manufacture. As result, he became chemist of the Boston Rubber Shoe Co. in July, 1887, and equipped a laboratory at their Malden plant. Thus, if not actually the first, Mr. Norris is one of the early chemists to be regularly employed on the factory staff of an American rubber manufacturing company.

WEBSTER NORRIS.

He was identified with the Boston Rubber Shoe Co. as chemist and assistant superintendent for a combined period of eight years. In 1895, he entered the mechanical goods division of the trade as chemist of the Revere Rubber Co. Subsequently he has been identified in a superintending capacity with several important companies, among them the Gutta Percha & Rubber Manufacturing Co., New York City; the Canadian Rubber Co., Limited, Montreal, Quebec, Canada; the Republic Rubber Co., Youngstown, Ohio, and the New York Rubber Co., New York City.

Mr. Norris has lectured on the technology of rubber at his Alma Mater, and several patents have been granted on his improvements in rubber-working machinery and factory equipment.

When THE INDIA RUBBER WORLD was founded, Mr. Norris promptly recognized it as a factor in advancing the development of the industry, and especially its value to the rubber chemist and superintendent. For many years he has contributed technical articles to its pages and in 1915 became identified with its staff in connection with the chemical department.

Mr. Norris is an expert in rubber factory equipment, processes, and operation. Throughout his career as a rubber technologist he has specialized in scientific compounding, the development of specification goods, and related problems in rubber goods manufacture.

He is engaged in developing long-cherished plans for serving as a consulting rubber technologist for American and foreign rubber manufacturers.

AERONAUTICAL EXPOSITION.

The Annual Aeronautical Exposition of the Manufacturers' Aircraft Association, Inc., will be held March 1-15 in the Madison Square Garden and the 69th Regiment armory, New York City. This exhibit will show the remarkable development of the flying machine from the first Langley and the original Wright machines to the Navy's newest flying boat, with the record carrying capacity of fifty passengers.

The United States Army and Navy Departments, together with the manufacturers, will display every type of airplane built in America during the war, including a complete exhibition illustrating the progress made in aerial ordnance, photography, the use of wireless and other developments. A collection of war trophies and captured German airplanes exactly as they were brought down behind the Allied lines will be exhibited.

The Obituary Record.

INVENTOR OF RUBBER PROCESSES.

CHARLES A. BESAW of the BeSaw Tire & Rubber Co., Hartville, Ohio, and Ardmore, Oklahoma, died at Guthrie, Oklahoma, February 6, aged 43 years. The burial was at Canton, Ohio.

Mr. BeSaw was born at Pleasant Grove, near Akron, Ohio. He entered the rubber business in 1900, being employed by the Diamond Rubber Co. in the technical department. In fact, it was in the technical departments almost exclusively in which he associated himself with the Milwaukee Rubber Works Co., Milwaukee, Wisconsin; the Firestone Tire & Rubber Co., Akron, Ohio; Swinehart Tire & Rubber Co., Akron, Ohio, and the Canton Rubber Co., Canton, Ohio. He was general superintendent of the Knight Tire & Rubber Co., Canton, Ohio, when, in 1916, he acquired control of the Quality Rubber Co., Hartsville, Ohio, which name he changed to BeSaw Tire & Rubber Co. and became president and general manager of the organization.

CHARLES A. BESAW.

In 1917 the capital of the company was increased to $1,000,000 and an additional factory was built at Ardmore, Oklahoma, and Mr. BeSaw made his residence in Guthrie, thus taking personal supervision of the business at the Ardmore plant, which, because of his business experience and technical knowledge, rapidly gained prestige and patronage. Mr. BeSaw was the inventor of the BeSaw process for reclaiming rubber, and was instrumental in perfecting several processes for the manipulation of rubber.

MANUFACTURER AND FINANCIER.

Daniel Neil Mason, vice-president and director of The Mason Tire & Rubber Co., Kent, Ohio, died at his residence in Cleveland, Ohio, of pneumonia, February 6, 1919, aged 31 years.

Mr. Mason was one of three brothers, all associated together in several business enterprises, one of which was the Mason Tire & Rubber Co., that was organized in the fall of 1915, and since that time hedevoted the major portion of his time to the financial end of the business. He was a partner in Mason Brothers Investment Securities Co., and vice-president in the newly organized Mason Cotton Fabrics Co. Indeed, it is claimed that his extreme enthusiasm in starting this new enterprise caused his last illness.

DANIEL N. MASON.

Mr. Mason was an intense worker. Whatever he did was done with all his might. He was known in financial circles as a wonderfully successful salesman. Young, sympathetic, naturally a leader, he was popular with the workers in the plant, attending the outdoor sports and field days, on which occasions, because of his splendid physique, he participated in athletic sports.

Mr. Mason is survived by his widow and a five-year-old daughter.

A POPULAR AND CAPABLE MAN.

A. C. Redman, industrial manager of The McGraw Tire & Rubber Co., East Palestine, Ohio, died of pneumonia on January 27, 1919. His demise constitutes a lamented loss, not only to the McGraw organization but to the community in which he made his home and took so prominent a part in business life and civic affairs.

Previous to 1914, when he entered the employ of the McGraw company as traffic manager, Mr. Redman spent a number of years in the service of the Adams Express Co.

A. C. REDMAN.

He was distinguished for his moral courage, energy, devotion to duty, and fair dealing—qualities which endeared him to his associates and won for him popularity and success as an executive of rare ability. As industrial manager, Mr. Redman came in constant daily touch with the employes, winning their confidence and respect in marked degree. It is the purpose of the McGraw company to execute his plans for the betterment, socially, physically and industrially, of its workmen.

Mr. Redman was a native of Circleville, Ohio, born June 15, 1885, and is survived by his father, widow, and two children.

A DIRECTOR OF THE CANADIAN CONSOLIDATED RUBBER CO., LIMITED.

Andrew A. Allan, a director of the Canadian Consolidated Rubber Co., Limited, of Montreal, Quebec, Canada, died at the Royal Victoria Hospital in that city Tuesday, February 11, 1919, following an operation performed the previous week.

He was the son of Andrew Allan, one of the founders of the Allan Line of steamships plying between Montreal and England. He was born in Montreal on June 16, 1860, educated at Rugby, England, and later by private tutors in France. He began business in the office of the Allan Line in 1877, admitted a partner in 1881 and later, with his brother, succeeded his father's interests. In 1910 he was elected president of the Shipping Federation of Canada and was for a time a member of the Montreal Board of Harbor Commissioners. He became a director of the Canadian Consolidated Rubber Co., Limited, in 1917, and was interested in a number of important industrial and financial corporations in Canada.

ANDREW A. ALLAN.

A SELF-MADE MAN.

Frederick R. Gillespie, of Hammill & Gillespie, dealers in compounding ingredients, etc., New York City, died at his residence in that city January 28, aged 74 years. He was born in Ireland, coming to New York when a boy, and entered the employ of the concern of which he was the head at the time of his death. He is survived by his widow and two daughters. Mr. Gillespie

was a man of large charities, was active in church work, and was highly respected by the trade.

FORMER TRENTON RUBBER MAN.

James D. Brady, formerly an official of the Standard Rubber Co., Trenton, New Jersey, died on January 2 at his home in Philadelphia, Pennsylvania, following an illness from typhoid fever. His body was interred in Riverview Cemetery, Trenton, New Jersey. Mr. Brady was 40 years old and is survived by his widow. He was a member of the Masonic fraternity and was active in Republican politics. After disposing of his interests in the Standard Rubber Co., he engaged in the coal business in Philadelphia.

A JAPANESE RUBBER IMPORTER.

Shunzo Takaki, a member of the firm of Mitsui & Co., Limited, crude rubber importers of Tokio, Japan and New York City, died in the latter place on January 29, aged 36 years.

The son of Baron Kanhiro Takaki, he was born in Tokio in 1883, and received his early education in that city. Coming to America he attended the University of Pennsylvania where he distinguished himself in athletic sports, especially tennis and baseball.

After his graduation he returned to Japan, married Miss Tatsuo Mitsui and allied himself with the great firm of Mitsui & Co., later returning to this country and settling in New York City. He was a member of the Nippon Club, the Japan Society, the Railroad Club, Aldine Club, and University of Pennsylvania Club, all of New York City. He leaves his widow and four children.

A REAL RUBBER BANK.

TIME was when rubber manufacturers approached banks with trepidation, or at least with a feeling of respectful gratitude, for they were big borrowers. It is also a matter of history that one large bank in New York said flatly and almost

THE FIRESTONE PARK TRUST & SAVINGS BANK.

profanely that it would never again touch anything in rubber.

The notable change that has come to the trade is shown not only in the bank directorships held by rubber men, by the eagerness of the banks for rubber accounts, but in a more spectacular way by the big rubber bank founded by Harvey S. Firestone, president of the Firestone Tire & Rubber Co., Akron, Ohio.

This institution is known as the Firestone Park Trust & Savings Bank. It was first established as the Rubber City Savings Bank in September, 1916, in temporary quarters on South Main street, but now occupies a large, new and handsome two-story fireproof building with every modern banking facility. At the end of that first month total deposits were only $32,140.60

HARVEY S. FIRESTONE, BANK PRESIDENT.

as compared with $2,307,686.61 at the end of 1918. These figures speak eloquently of the place this institution is taking in the remarkable development of southern Akron and the neighboring towns of Kenmore and Barberton. Founded on broad, sound banking principles and ably by the treasurer, L. B. Waters, a banker of wide experience, it is rendering an important service to the individuals and business houses of the community.

The officers of the bank are: president, Harvey S. Firestone; vice-president, J. G. Robertson; treasurer, L. B. Walters, secretary, E. A. Oberlin, Jr.; directors, Harvey S. Firestone, J. G. Robertson, F. W. Albrecht, John Hearty, L. B. Walters, Jacob Pfeiffer, J. M. Beck, J. W. Thomas, S. G. Carlshuff.

In common with most banking institutions it has well-organized commercial, foreign, savings, trust, safety deposit and legal departments managed by expert banking specialists. Also it maintains a steamship and foreign travel department for the benefit of foreigners, their families abroad and Americans planning extended business or pleasure trips; a real estate department which, under the style of the Coventry Land & Improvement Co., handles most of the real estate affairs of Firestone Park, and a payroll room for the use of industrial clients.

Excellent financial condition was indicated by the statement of December 31, 1918, which follows:

RESOURCES.

Cash on hand and in banks	$324,455.87
Demand Loans	509,446.41
Bonds and other securities	353,900.00
	$1,187,802.28
Loans secured by mortgage	$314,941.60
All other loans and discounts	1,074,794.14
Overdrafts	352.02
Real estate	81,667.49
Furniture and fixtures	4,916.10
	$2,664,473.63

LIABILITIES.

Capital stock	$100,000.00
Surplus	50,000.00
Undivided profits (less expenses)	44,582.06
Deposits	2,307,686.61
U. S. Deposits	43,000.00
Payments on United States Liberty Bonds	119,204.96
	$2,664,473.63

THE RUBBER TRADE IN OHIO.

By Our Special Correspondent.

LIEUTENANT-COLONEL A. B. JONES, of The B. F. Goodrich Co., Akron, has returned from overseas where he has been Deputy Commissioner of the Red Cross in France and in charge for the last three months of all Red Cross work in that country. He resumes his duties as director of plant administration for the Goodrich company, feeling that the Red Cross has done a man-sized job during the four years of the world war.

LIEUTENANT-COLONEL A. B. JONES.

There were approximately 6,500 people in the Red Cross organization in France, about half of them women. The monthly expenditure was $5,000,000, of which Mr. Jones had the supervision. The overhead administrative cost, including salaries, of which there were few among the executives, amounted to perhaps three per cent. of the total.

Mr. Jones says that the whole story of the Red Cross is one of innumerable instances of devotion, loyal service, and fine intelligence. It was the Red Cross that revived the morale of the French in 1916 when the soldiers returned home on leave to find their families starving. The Red Cross looked after the families and so put new heart into the men.

After the armistice was signed the first job was to get the American prisoners out of Germany. There were only 3,500 of them and the Red Cross got them all back in 10 days.

H. L. Zimmerman has been promoted to the position of traffic manager for The B. F. Goodrich Co., Akron.

The balloon room of The B. F. Goodrich Co., Akron, has been converted into a gymnasium and will be in charge of the Athletic Association, of which Edward Connelly is athletic director. Three basket-ball courts will be laid out as well as spaces for volley ball and hand ball. Noon-day dances are being held in the new gymnasium.

The Goodrich organization will play independent baseball this season, not having become identified with the newly formed league of industrial athletes.

The B. F. Goodrich Co. has added ten more names to the list of its pensioned employes. The terms of service of these men range from eight to 43 years.

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Robert T. Griffith, general superintendent of the Miller Rubber Co., Akron, has been elected to membership on the Board of Education to succeed Dr. J. H. Seiler, resigned.

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J. F. Barnett, manager of the crude rubber department of the Firestone Tire & Rubber Co., Akron, has gone to Singapore to investigate banking and financial conditions as well as to visit rubber plantations and study planting conditions in that locality. He will probably be absent six months.

W. W. Wright will represent the export department of the Firestone Tire & Rubber Co., Akron, in Singapore, to which he has recently gone.

William Teeuwen will represent the Firestone Tire & Rubber Co., Akron, in the Dutch East Indies as a salesman.

John B. Tuttle, head of the research department of the Firestone Tire & Rubber Co., Akron, has become abstractor of rubber literature in the department of rubber and allied substances for "Chemical Abstracts," published by the American Chemical Society. He succeeds Raxley F. Weber, recently deceased.

R. J. Firestone has resigned as vice-president and director of sales of the Firestone Tire & Rubber Co., Akron, but retains his interest in the company and membership on the board of directors.

* * *

The Faultless Rubber Co., Ashland, had a pleasing exhibit of its rubber toys and balloons on display at the toy show held at the Imperial Hotel, New York City, during February. The display was in charge of A. H. Otis, the former European representative of the company. One of the features of the exhibit was "Sweetie," one of the company's red rubber dolls, in half-size, three inches tall instead of six. Another interesting toy was a red balloon of extra quality rubber which an individual could inflate to a diameter of approximately 18 inches, but which it was said could be inflated by pressure to 27.

* * *

The United States Government has taken over Wingfoot Lake for a central training station for lighter-than-aircraft. The Goodyear Tire & Rubber Co.'s control of the property will terminate June 1, 1919. At this station there have recently been about 275 men in training, of whom half were enrolled in the Navy, being instructed in observation work and the operation of dirigible balloons. It is said that this will be the only training station of the kind in the United States. Early in February thirty men were graduated, on which occasion balloon races were held between pilots and Goodyear company officials made addresses. In future, only West Point and Annapolis graduates are to be eligible to train at Wingfoot Lake, under government ruling.

The Goodyear Tire & Rubber Co., Akron, has made the following appointments in its export department: C. L. Diers, former Indianapolis district manager, now manager of European division of export department, covering all activities of the company in Europe, Asiatic Russia, and the northern coast of Africa; C. H. Williams, former Chicago branch manager, now manager of Far Eastern division, covering the Philippines, China, Japan, Java, Siam, India, and Eastern Russia; A. G. Cameron, former St. Louis branch manager, now manager of Australasian division, covering Australia, New Zealand, and South Africa. Although this work will be carried on mainly from the Akron offices, these men will personally visit their respective fields at regular intervals to familiarize themselves with merchandising conditions and requirements.

The Silent Club, composed of mute employes of The Goodyear Tire & Rubber Co., recently opened club rooms in the building opposite the factory office of the company. This is perhaps the only club of the kind in the country. The facilities of the new quarters include reading and lounging rooms, pool tables, and the usual club-house features. On the opening night the club gave a smoker and open-house party at which the mute athletic organization furnished the entertainment. The Goodyear company employs about 300 mutes in various departments.

* * *

The Mohawk Rubber Co., Akron, recently elected the following officers: R. M. Pillmore, president; J. K. Williams, vice-president; M. E. Mason, secretary; C. W. McLaughlin, treasurer; and S. S. Miller, factory manager. These also constitute the board of directors, together with Messrs. H. L. Rose, Francis Seiberling, and George A. Parker, who were reelected.

* * *

O. L. Travis has been appointed sales manager for The Owen Tire & Rubber Co., Bedford, Ohio.

Casper Smith, sales director of the Katzenbach & Bullock Co., New York City, recently called on the trade in Akron and other points in Ohio.

* * *

D. W. Brown has resigned his position as advertising manager of The Republic Rubber Corp., Youngstown, Ohio, to devote his entire attention to his weekly publication, the "Youngstown Citizen." He is succeeded by Honor Blocker, who for two years has been Mr. Brown's understudy and assistant.

* * *

Charles E. Wood, dealer in crude rubber, 149 Broadway, New York City, announces that, owing to a change of name of the building where the Akron office is located, correspondence should be addressed to the Akron representative at 328 Central Savings & Trust Building instead of 328 Hamilton Building.

* * *

The New Tread Tire Co., Columbiana, has been recently incorporated, as noted elsewhere in this issue. It is equipping with modern machinery a two-story brick building with about 20,000 square feet of floor space for a factory where it will rebuild and retread auto tires. The officers of the company are: F. H. Groves, president; S. W. Tidd, vice-president; C. U. Calvin, secretary and treasurer; and E. P. Altenburg, general manager. The capital stock is $100,000.

* * *

At a recent meeting of the stockholders of The Mansfield Tire & Rubber Co., Mansfield, Ohio, George W. Stevens was elected vice-president and general manager, succeeding George W. Henne who retires from the office to direct his attention to other interests, although he retains his place on the board of directors. Mr. Henne is president of the New Jersey Car Spring & Rubber Co., Inc., Jersey City, New Jersey, which he reorganized some months ago. Mr. Stevens was formerly with the Federal Tire & Rubber Co., Milwaukee, Wisconsin.

The Mansfield Tire & Rubber Co., has elected the following officers: Judge C. R. Grant, president; George W. Stevens, vice-president and general manager; Jesse E. LaDow, secretary; Charles Hoffman, treasurer; and A. C. Moore, assistant treasurer.

* * *

The Rotary Tire & Rubber Co., Columbus, with factory at Zanesville, has made Barton Griffith treasurer of the company and Charles W. Bryson and Mr. Griffith are two of its directors.

* * *

The Sandusky Tire & Rubber Co., formerly at Sandusky, Ohio, has changed its name to The Ohio State Rubber Tire Co., and is now located at Port Clinton, Ohio. S. M. and W. O. Bruess are interested in the company.

* * *

The National Tire & Rubber Co., East Palestine, Ohio, is building a large addition to its factory, in which it plans to manufacture two new brands of high-grade guaranteed tires for the jobbing trade.

This company has just arranged for life insurance for its employes along the lines followed by other similar companies, the policy costing the employe nothing and increasing in value automatically with the employe's increased length of service.

* * *

The Bucyrus Tire & Rubber Co., Inc., Bucyrus, Ohio, has changed its name to Henderson Tire & Rubber Co., Inc., but the officers and organization remain the same.

* * *

Samuel L. McClune, Cleveland, Ohio, has been elected a director of The McGraw Tire & Rubber Co., East Palestine, Ohio.

* * *

The Gordon Rubber Co., Canton, Ohio, at its annual meeting elected the following directors: Samuel Ake, E. A. Bowman, Judge Henry W. Harter, C. J., C. W. and W. E. Keplinger, H. B. McMaster, J. F. O'Dea, and H. S. Renkert. The directors have elected the following officers: H. B. McMaster, president and general manager; C. K. Keplinger, vice-president; C. J. Keplinger, secretary and treasurer. The company is now manufacturing only automobile tires and tubes, having disposed of its druggists' sundries business.

THE RUBBER TRADE IN MASSACHUSETTS.

By Our Regular Correspondent.

A SPECIAL meeting of the foremen and executives of the Stoughton Rubber Co., Stoughton, Massachusetts, was held at the office of the plant January 29, at which Ira F. Burnham, for more than 40 years at the head of that factory, introduced as his successor C. L. Wanamaker, a young man who had been specially fitted for such a position by intensive practical education. He is a graduate of Dartmouth College, and also of the Tuck School of Business Administration and Finance, and his practical education in the rubber business was acquired at Naugatuck and New Haven, Connecticut, Williamsport, Pennsylvania, and Cambridgeport, Massachusetts. He is thus well-trained in both technical and administrative duties.

Mr. Burnham will still live in Stoughton, and will, to a certain extent, hold an advisory position in connection with the Stoughton Rubber Co., but being relieved of the detail, will be able to devote himself to the perfection of a new plan, and the installation of a new department of the United States Rubber Co.

At the meeting, as special guests and representatives of the general management of the United States Rubber Co., were: Myron H. Clark, general factory manager; Arthur T. Hopkins, assistant general manager footwear division; Charles T. McCarthy, secretary to Mr. Hopkins; and W. D. Holden.

* * *

EDWIN H. KIDDER.

Edwin H. Kidder, manager of the Boston branch of the United States Tire Co., who has been in military service for several months, has returned to civilian life, and resumed the duties of the above office. Mr. Kidder is one of the best known and most popular men connected with the tire industry in Boston, and he received a royal welcome on his return to business.

* * *

Following the resignation of W. B. Gleason as secretary-treasurer of the Revere Rubber Co., Chelsea, Massachusetts. John D. Carberry was chosen secretary and W. H. Blackwell treasurer, with offices in New York City. F. L. Bunker as assistant treasurer has his headquarters at the plant in Chelsea.

* * *

The United States Rubber Co. has sold a large plot of land in Chelsea to the Winnisimmet Land Co., which will improve and develop it for a ship-yard. Situated in the down-town section of the city and extending to the Harbor Commissioners' line, the property is admirably fitted for such use. Containing over 90,000 square feet, it is pronounced one of the finest pieces of wharf property in the city, and was assessed at $109,700. It is said that the price paid was largely in excess of that figure. The plots (there were two of them), were not being industrially utilized by the United States Rubber Co. at the time of the sale.

* * *

The C. & C. Raincoat Co., formerly at East Boston, but which has a factory on Washington street, Boston, has purchased a tract of land in Stoughton, Massachusetts, on which it proposes to erect a two-story factory, 200 feet long and 40 feet wide, mill construction, in which to manufacture raincoats and over-

alls. The contract for the erection of the factory has been signed, and it is stated that the work will be pushed forward so that the company can transfer its business within a few months, when 200 hands will be employed.

* * *

Revere Building, 60-66 High street, which houses the mechanical department of the United States Rubber Co. in Boston, was the scene of a rather lively fire on February 9. The blaze was confined to the fourth floor, occupied by the American Toilet Goods Co., and owing to the fireproof and waterproof construction of the building, the rubber concern's portion of the premises suffered but an inconsiderable inconvenience and little damage.

* * *

The Rubber Manufacturers' Mutual Insurance Co. held its annual meeting in this city on January 22, 1919, and re-elected the five directors whose terms expired on that date, thus continuing the board of directors and the officers as before. The officers are: Arthur H. Lowe, president; George B. Hodgman, vice-president; Benjamin Taft, secretary and treasurer. The directors include, besides the above, Marcus Beebe, C. C. Converse, E. H. Clapp, F. W. Pitcher, H. E. Converse, C. T. Plunkett, J. P. Stevens, C. A. Stone, B. F. Peach, E. Frank Lewis, and Lester Leland. The affiliated companies, namely the Industrial Mutual Insurance Co. and the Cotton and Woolen Manufacturers' Insurance Co. of New England, held annual meetings on the same date, and re-elected the same boards of managers and officers that had served the previous year.

* * *

Lieutenant Leon A. Field, who, before entering service was assistant to the master mechanic of the Boston Rubber Shoe Co., was given a complimentary dinner at the Aldine, Melrose, Massachusetts, late in January, by his immediate business associates of Factory No. 2. George L. Lawrence, Jr., factory manager, was toastmaster, and several short addresses were made. Lieutenant Field gave a very interesting account of his experiences overseas.

Lieutenant Field was born in New Hampshire July 11, 1891, and attended the public schools in Biddeford, Maine, graduating from the University of Maine, at Orono, that state, in 1914, and at once commenced work at the factory of the Boston Rubber Shoe Co. Entering the Third Officers' Training Camp in January, 1918, he was commissioned second lieutenant the following March, sailing for Brest March 21. He served at Southampton, the tank training center for all British tanks, also at Havre, Beauvais, and Tours, and was in action at Soissons. He celebrated Christmas, 1918, by sailing for the United States, and was recently mustered out at Camp Humphrey, Virginia.

* * *

The Hood Tire Sales Co. was organized in Watertown, Massachusetts, about a year ago, for the sale of Hood Tires. About the first of last month the concern opened a store at 1041 Commonwealth avenue, in the automobile section of Boston, where are carried in stock all sizes and treads of the Hood Rubber Company's tires. With a sales force and mechanical staff a lively season is expected.

D. Janion MacNichol, the new president and manager of the Hood Tire Sales Co., makes his headquarters at this Boston store. Mr. MacNichol was formerly New England manager of the Chicago advertising agency concern of Critchfield & Co., a position he relinquished to assume the management of the tire sales company.

* * *

Henry Chase Hopewell, son of the late John Hopewell, and connected with the carriage cloth firm of L. C. Chase & Co., Boston, was married last month to Miss Hilda Prince, daughter of James P. Prince, of Lexington, this state. Owing to the illness of his mother, the wedding was a quiet one.

Only a few days later his mother died at her residence in Newton. She was born in Springfield, Massachusetts, in 1844, and was married to John Hopewell October 20, 1870. The family resided in Cambridge for nearly 30 years, part of which time Mr. Hopewell was mayor of that city. She leaves three sons, Charles F., Frank B., and Henry C. Hopewell and two daughters, Mrs. Mabel G. Casselberry and Mrs. Nellie H. Colby.

* * *

The foremen and assistant foremen of The Fisk Rubber Co., Chicopee Falls, gave a banquet at the Worthy Hotel, Springfield, on the evening of February 1, 1919. About 150 employes of the company were present.

* * *

The Hewitt Rubber Co. of Massachusetts, recently incorporated, has opened a salesroom at 48 Gloucester street, to handle the New England sales of Hewitt tires, manufactured by Hewitt Rubber Co., Buffalo, New York. W. S. Carleton, formerly with the Republic Rubber Co., but who for the last nine months has been in the service of the United States Shipping Board in Philadelphia, is manager. Associated with him are F. M. Broadhead, for the last year or more with the 101st Engineers, in France, and T. H. Morgan, both of whom were formerly identified with the Republic Rubber Corp.

THE RUBBER TRADE IN NEW JERSEY.

By Our Regular Correspondent.

THE Eckrode Rubber Co., of Newark, has been incorporated at Trenton with a capital stock of $100,000 to engage in the manufacture of automobile tires, tubes and other rubber goods. The officers are Clement Eckrode, Highland Park, president; G. F. Hensler, Newark, vice-president; A. G. Hensler, Newark, secretary and treasurer. A large factory has been leased at 118-20-22 Adams street, Newark, where a large number of hands will be employed. Mr. Eckrode formerly was in charge of the Endurance tire plant at New Brunswick, New Jersey, which has been taken over by the Hardman Rubber Co.

* * *

Charles E Stokes, vice-president of the Home Rubber Co., has been appointed chairman of the War Council of the Episcopal diocese of New Jersey. The diocese is seeking to raise $250,000 for work among the army camps.

* * *

Herbert H. Coleman, of East Orange, New Jersey, president of the Delion Tire & Rubber Co., Trenton, sailed for France on February 18 on a business trip of about five weeks.

* * *

The Lambertville Rubber Co., Lambertville, New Jersey, has just completed an addition to its plant. The building is of concrete and will be used for storage purposes.

* * *

Clement Ehret, general auditor of The Empire Rubber & Tire Corp., who recently resigned to accept a position in New York City, was presented with a handsome diamond cluster scarf pin by the office force. The presentation was made by H. E. Berrien, the cashier of the concern. Mr. Ehret has been connected with the Empire company since 1917.

* * *

William J. B. Stokes, treasurer of the Thermoid Rubber Co., has been made chairman of the committee to solicit funds for the erection of a new $1,000,000 hotel at Trenton. He has also been made president of the new hotel company. The following rubber companies have subscribed toward the project: United & Globe Rubber Manufacturing Cos., Luzerne Rubber Co., De-Laski & Thropp, Circular Woven Tire Co., DeBlois Tire & Rubber Co., Woven Steel Hose & Rubber Co., Semple Rubber Co., Louis Destribats, manager Ajax Rubber Co., Inc., William H. Servis, vice-president of the Hamilton Rubber Manufacturing Co. William J. B. Stokes and his brother, J. Oliver Stokes,

treasurer of the Joseph Stokes Rubber Co. and the Home Rubber Co., head the rubber list.

* * *

Lionel Emdin, the founder of the Delion Tire & Rubber Co. plant at Trenton, announces that he will shortly break ground at Asbury Park for the erection of a rubber plant for the Victory Tire & Rubber Co. The factory will be located on Third and Fourth avenues and will have a siding running to the Central Railroad. The new plant will be of brick, two stories high and about 80 by 175 feet, with a daily capacity of 200 tires and tubes. Nothing but high-grade goods will be made, all having 6,000-mile guarantee. The necessary machinery has been ordered and it is expected that the new plant will be in operation in June.

* * *

Ensign George T. Oakley, naval aviator, son of Clifford H. Oakley, president of the Essex Rubber Co., has been assigned to inactive duty and has returned home from Pensacola, Florida. Ensign Oakley enlisted April 25, 1917, as a second-class seaman and was assigned to the U. S. S. *Niagara*. After being in the service for several months he went into the aviation section, United States Naval Reserve Force, and was trained at the Massachusetts Institute of Technology for a pilot. He was then sent to Pensacola for final flying work after training at Bay Shore, Long Island. He was making a flight at Key West when his airship fell into the ocean. He was rescued with another aviator

* * *

William J. B. Stokes, president of the Thermoid Rubber Co., has been appointed chairman for Mercer County, this state, for the Fifth Liberty Loan, which begins Easter Monday. He was chairman of the last loan campaign and did splendid work.

WELLMAN-SEAVER-MORGAN CO. ELECTS OFFICERS.

The Wellman-Seaver-Morgan Co., Cleveland, Ohio, at its annual meeting of stockholders on February 18, 1919, reelected the following directors: Edwin S. Church (president and general manager), F. E. Borton, W. H. Cowell (secretary and treasurer), F. B. Richards, S. T. Wellman, E. H. Whitlock, S. H. Pitkin (vice-president), Francis Seiberling, and F. A. Seiberling. George W. Burrell was elected second vice-president and will have charge of the company's works at both Cleveland and Akron.

CROSS COUNTRY TIRE CO., INC.

The Cross Country Tire Co., 343 Babcock street, Buffalo, New York, manufactures rebuilt auto tires from select carcasses that have been prematurely discarded. These are first repaired, then relined and a new cushion, breaker, tread and side wall applied. The line includes various non-skid tire designs. R. M. Loewenthal is president, and Jack Sider, secretary, of the company.

F. R. HENDERSON & CO. OPEN OFFICES IN SINGAPORE AND BATAVIA.

That fair business dealing and American enterprise are productive of commercial success is shown by recent developments in the firm of F. R. Henderson & Co., crude rubber importers, New York City and Akron, Ohio.

Francis R. Henderson, the head of the concern, has recently returned from a six months' business sojourn in the Far East, having visited the Federated Malay States, Straits Settlements, Java and Sumatra.

Mr. Henderson spent three months in Singapore where he acquired the property and business of the International Trading Co., Limited, that was merged in the new firm of Henderson Brothers Limited, Singapore, Straits Settlement. While in Batavia he established the firm of Henderson & Keulemans, Limited, (Handel Maatschappij Henderson & Keulemans.) Batavia, Java. The associate, G. J. M. Keulemans, is a Hollander with broad experience in plantation rubber and well known by planters in the Far East.

THE RUBBER ASSOCIATION'S EFFICIENT SECRETARY.

IN the last five years many men have accomplished much for the good of the rubber trade. Of these successful workers a prominent place belongs to the secretary and treasurer of The Rubber Association, Harry Stephen Vorhis. At this time, therefore, a sketch of his career is of interest.

Mr. Vorhis was born in Spencer, New York, in 1873. After attending Spencer Academy and Franklin Academy at Prattsburgh, New York, he entered Yale University, graduating in 1895. During his college life he worked on the staff of the "Journal & Courier," a well-known New Haven paper. He later studied for a year at the New York Law School. Newspaper work was his ambition, however, and he served in various news and advertising positions previous to joining the staff of the New York "Sun" in 1900. Five years later he left to work on various New York and Boston financial and trade papers.

Underwood & Underwood, N. Y.
H. S. VORHIS.

Two years before the great war The Rubber Association enlarged its scope and leaders in the rubber trade felt that a competent secretary was needed to carry out the plans they had formulated. The choice fell upon Mr. Vorhis and this selection has proved a wise one.

At the beginning of the European war complications regarding rubber imports resulted in the Association becoming advisory to the British Consul in New York City, to whom all crude rubber entering this country was consigned, and later the entire matter of receiving and allocating was turned over to the Association. How well this matter has been handled is too well known in the trade to need comment here. The work required the organization of a force of 50 or more employes, all under Mr. Vorhis' direct charge. Mr. Vorhis does not belong to the Secretaries' Union nor does he know anything about the eight-hour day. His office day over, he is usually to be found at the Union League, the Yale, or the Lotus, or wherever important rubber committees are to be found. There he answers questions, produces documents and makes a careful record of discussions, of suggestions, wise and otherwise, and of final decisions. Then, when the rest sleep, he puts the matter into shape against the demands of the morrow. He never rests, never complains, never "leaks." As an earnest, tireless worker he is without par, and has carried out the plans of the rubber committees, big and little, with unvarying intelligence and efficiency. With it all he is modest, likable and extremely popular.

RUBBER SUBSTITUTE FACTORY IN NORWAY.

Det Tekniske Finansindustri, Christiania, has acquired the sole right for Scandinavia to manufacture a rubber substitute from materials found in Norway. This is said to have been tried for many years, and is expected to be of great importance to Scandinavian rubber consumers, as it costs not more than a fraction of the price of real rubber. The company was started with a capital of $134,000, and is now increasing it to $576,000.

RUBBER IMPORTS INTO ST. PIERRE-MIQUELON.

Rubber footwear imports into St. Pierre-Miquelon, for 1917, amounted to $16,076 from Canada, $14,930 from the United States and $183 from France.

Activities of The Rubber Association of America.

MANUFACTURERS ASKED TO SUPPORT ASSOCIATION REVENUE PLAN.

January 28, 1919.

To manufacturing members:

ONLY a few years ago and just prior to the war the Rubber Association organization consisted of a secretary and one stenographer. The income of the Association in 1912 amounted to $1,616.25, and was derived from initiation fees and dues. The expenses of the Association during that year amounted to $829.90. For the year of 1918 the income was $213,205.82 and the expenses $199,614.75. In other words the Association has in a few short years grown from a social organization into a broad, active organization vitally representing the interests of the industry. The expenses due to war work have ceased. The revenue due to this same cause is about to cease. Much of the work started during the war can be continued for the benefit of the industry provided arrangements can be made to provide the necessary funds.

At the annual meeting it was unanimously voted to continue the work and provide funds by a tax upon crude rubber. The general feeling was that this assessment should be three (3) cents per hundred pounds. This will provide for an income somewhat in excess of present requirements and will enable the Association to increase its permanent investment fund. If at any time in the future this fund reaches such an amount that the income from it is sufficient to pay the running expenses then the assessment could be discontinued.

An assessment on crude rubber purchased by manufacturers is an eminently fair method of raising funds, inasmuch as it equitably distributes the burden among the large and small manufacturers and goes into the cost of all alike. Three cents per 100 pounds is only .0003-cent per pound .0006 per cent on 50-cent rubber, and yet this small amount if paid by all will yield a revenue of approximately $100,000 per year to the Association. It would obviously be unfair for some to pay and others not to pay and still derive the same benefits.

This assessment will take effect January 20, when the old charge was abolished, and it is therefore hoped that all manufacturers will agree to the revenue plan which is enclosed herewith. Please have it signed by an official of your company and returned to the secretary in the enclosed envelope.

The manufacturers are the important beneficiaries of the proposed work of the Association. The importers are also benefited but in a smaller degree and it was the sense of the meeting that in acting as a collection agency for the fund they would be doing their part.

It is proposed to have a published list of manufacturers signing the agreement and a copy of this will be given each manufacturer as well as each importer, dealer, and broker.

THE SECRETARY.

MANUFACTURERS' AGREEMENT.

From (name of manufacturer). (Address.)

To The Rubber Association of America:

We hereby agree to pay to The Rubber Association of America an amount equal to three (3) cents per hundred net pounds of crude rubber purchased by us.

If purchasing is made through an importer, dealer, or broker, we hereby authorize the charging of this amount on the invoice with the understanding that said importer, dealer, or broker will, upon receipt, remit the amount thus collected to The Rubber Association of America.

We further agree to make a confidential quarterly report to the secretary of the Association which will show the amounts collected from us for the account of the Association, by the various importers, dealers and brokers.

It is understood that the figures shall be available only to the secretary and auditor of the Association. It is further understood that any surplus remaining after paying the current expenses shall be invested and added to the permanent funds of the Association.

In the case of direct importations of crude rubber made by us we agree to remit to The Rubber Association of America an amount equal to three (3) cents per hundred pounds on all rubber so received.

It is further understood that funds so collected shall be held and used only for the common good of the members of The Rubber Association of America, and that the continuation of this assessment shall be considered at the annual meeting of the Association.

THE RUBBER ASSOCIATION OF AMERICA.

By_____

(Signature of manufacturer.)

FIRM MEMBERS' BALLOT ON TRUST LEGISLATION.

February 15, 1919.

To the firm members:

By direction of the board of directors, we are enclosing you herewith a copy of Referendum No. 26 of the Chamber of Commerce of the United States of America on the report of the Federal Trade Committee of the Chamber regarding Trust Legislation.

This recommends (1) consideration by Congress of all anti-trade legislation, (2) formulation of standards of general business conduct to be administered by a supervisory body, (3) an enlarged Federal Trade Commission of nine instead of five members, (4) which should be made the supervisory body. It is, therefore, of immediate importance that an expression of the opinion of the best business minds of the country be obtained regarding this highly pertinent subject.

On the enclosed ballot, we would ask that you register your opinion with regard to the several questions asked, and return to the secretary not later than March 14, 1919.

THE SECRETARY.

BALLOT.

REFERENDUM NO. 26 OF THE CHAMBER OF COMMERCE OF THE UNITED STATES OF AMERICA.

To The Secretary of the Rubber Association of America:

Dear Sir:

We desire to record our vote on the proposal of the Chamber of Commerce of the United States of America as noted below:

I. The committee recommends that Congress should at once consider the situation of all statutes constituting our anti-trust legislation.

In favor
Opposed

II. The committee recommends there should be formulated standards of general business conduct to be administered by a supervisory body.

In favor
Opposed

III. The committee recommends that an enlarged Federal Trade Commission should be made the supervisory body.

In favor
Opposed

IV. The committee recommends that the membership of the Federal Trade Commission should be increased from five to nine.

In favor
Opposed

Attest:

(Signature of Firm Representative.)

FREIGHT TRAFFIC PERMITS FOR DOMESTIC FREIGHT.

February 14, 1919.

To all firm members:

Your attention is directed to the following advices issued by the Allegheny and Eastern Regions of the United States Railroad Administration respecting the cancellation on February 15 of the permit system now applicable on domestic freight for New York:

Please cancel, effective February 15, 1919, the embargoes placed as a war emergency January 15, 1918, against carload domestic freight for Manhattan Island, the Bronx (New York City) and station deliveries on New York Harbor, including Brooklyn Terminal Companies, which freight is now being moved under F. T. C. permits issued by the Freight Traffic Committee, North Atlantic Ports.

Effective as above such freight may move without permits subject to embargoes of the delivering railroads.

No change will be made in the method of permitting export carload freight for the present; and carload domestic freight must not be accepted for other than regular station deliveries. Reconsignment for export or lighterage deliveries will not be allowed.

MANAGER, TRAFFIC DIVISION.

The Rubber Trade in Great Britain.

By Our Regular Correspondent.

RAW RUBBER.

SUPPLIES of Brazilian fine rubber are now coming to hand since shipping has become available. There is still, however, considerable delay at the ports, rubber which arrived in Liverpool in the first week of December not reaching the rubber works until the middle of January. This rubber was bought at a considerably higher price than to-day's quotations, but of course the future position could not be foreseen and supplies had to be assured. Now the premium on Brazilian is much lower than it was, the determining factor being shipping facilities. Rubber works generally seem to be pretty well supplied for their raw product and there is little buying at the satisfactory price of 2*s.* per pound. Indeed, there is a good deal on hand and more to come forward at 1*s.* 9*d.* per pound, and in some quarters there is a disposition to wish that the price would rise. There does not seem much chance of this, however, as long as the blockade of Germany continues and until the factories of Germany, Austria, and Russia get into full swing again. I hear of quite a large inquiry for raw rubber from Switzerland, which seems somewhat strange as this is not a manufacturing country.

TRADE CONDITIONS.

The past month has been characterized by much the same conditions as the preceding. There is a halting tone in the rubber trade as in most others, the fixation of contracts being deferred for the more favorable prices which buyers are always anticipating in the following week. With regard to the home rubber trade, the armistice came at the worst time of the year and general business has not progressed according to expectations. In fact, there is a good deal of pessimism to be met with because expenses and taxes show no signs of diminution with the cessation of so much government business. Government work naturally has not come to an end; even in peacetime there is always business doing and there will be for some time large armies to be equipped. One or two classes of rubber goods, particularly those where spreading is concerned, have had their production entirely stopped, leaving a good deal of plant capacity idle, but in a general way the proofers by working ordinary hours and stopping all overtime have been able to dispense with any drastic dismissal of employes.

RUBBER CARD CLOTH.

In the November issue I referred to the rubber card cloth in which a large business has always been done between British manufacturers and Continental spinners. This trade was naturally much upset by the war and it does not look as if it would be resumed as quickly as was expected. This is entirely because of price. The material is wanted badly by the numerous mills which are now being rebuilt and put in order in Belgium and France and plenty of inquiries and orders have come to England. However, these have reference to pre-war prices which are quite out of the question on account of the rises in cotton, steel, and labor. Like many other rubber goods, the rubber in card clothing, though a most important component, does not form the whole or even the major part of the finished articles, so the fact that there has been no rise in the price of rubber has not a great bearing on the matter. Buyers no doubt will come to recognize that higher prices will have to be paid, but at the time of writing there is absolutely nothing doing in the Continental business referred to.

LABOR CONDITIONS.

The high rates of wages paid to munition workers and the numerous bonuses granted to workers of almost all kinds on account of the increased cost of living have caused a general upset in the labor world and on all sides one reads of persistent demands for higher wages, in nearly all cases coupled with a request for shorter working hours. This hardly looks promising for a large increase of trade at competitive prices, though I think it may be taken for granted that the same sort of thing will be experienced to a greater or less extent all over Europe. The engineers' demand for a 47-hour week with no work before breakfast having been generally conceded, the cotton and other large industries are agitating in the same direction. It is stated by the men that there will be no diminution in the output, this being rather suggestive of slackness in the past. The employers say that they will not be able to check this statement until some months, possibly a year, has passed under the new conditions. The 48-hour week having been established, there is now talk of a 44-hour week. So far these movements have affected only the fringe of the rubber trade, *i. e.*, the mechanical shops found in the larger works, but no doubt the whole trade will shortly be affected.

A good deal of resentment is shown by British workers at having to pay income tax and there is a strong disposition in some quarters to keep earnings below the taxable limit. In America I understand the case is different and the work people earn as much money as they can. This means that output is maintained and no doubt increased, while the action of our workers has the opposite effect. It is this rise in the cost of labor that must effectively prevent any return to pre-war prices in the case of almost every article of expenditure, whatever may be the fluctuation in the price of materials.

DUROPRENE.

This is a new varnish put upon the market by the United Alkali Co., Limited. Although its composition is not divulged in the trade circulars which extol its many desirable properties, it is understood to consist largely of the hydrochloride of caoutchouc, or whatever may be the correct designation of the white body produced by the action of chlorine upon rubber. The kaloid derivatives of rubber have now been known for many years in the chemical laboratories, but it is only in the last year or two that they have been put to commercial use, the pioneer in this movement having been S. Peachey, of Manchester. Duroprene is a thick viscous liquid which may be thinned by various diluents if the purchaser for special purposes so desires. A strong point is made of its noninflammability, and it has found favor as a fireproof dope as well as for varnishing wood and metal work of all kinds as a precaution against damp. It is claimed that its noninflammable character makes it superior to most agents as a waterproofing medium. I do not know whether this is capable of replacing rubber in this connection, but it is a quite new application of rubber. The price for single gallons is 14*s.*, while for 100 gallons it is reduced to 12*s.* 6*d.* per gallon f. o. b. works, which are at Widner, Lancashire.

THE SOLVENT POSITION.

The contracts for solvent naphtha for 1919 rule about 2*s.* 9*d.* per gallon, a considerable reduction from the prices of the last two years, but still much higher than is liked in the now closely competitive spreading branch of the trade. The increased use of coal-tar products for mixing with petrol for motor purposes has had the effect of keeping up prices for the former. Thus benzol, which is now free from government control, is quoted at 2*s.* 6*d.* per gallon, though it may be taken for granted that this price will come down as further stocks of petrol become available. Benzol has never been at all popular with proofers

and at the present price they are not inclined to look at it, though the case might be different if it were half the price of solvent naphtha. This question of the supply and price of solvents is closely connected with pleasure motoring, about the immediate revival of which quite diverse opinions are expressed. I am disposed to agree with those who say that it will be some time before we see anything like the pre-war rate of pleasure motoring because the prices all around, including hotel accommodations, are much higher and the increase in the income taxes is not to be ignored.

THOSE RUBBER TEATS.

A good deal of correspondence, of course politically flavored, has been going on with regard to the sending to Germany of a million rubber teats by the Women's International Association. I do not know the name of the British firm which filled the order, but it must be one of three or four which I have in mind, because these goods are not made in many of our works. I understand that the distribution is in the hands of the Red Cross. I have not made any calculation as to what weight of rubber is involved, but I think that those people who imagine that a large number of motor tires will promptly make their appearance in Berlin are alarming themselves needlessly. Anyway, the house to house collection and subsequent reclaiming will not be done in a day.

BARYTES.

The price of barytes has gone up very much during the war, owing to the imports from Germany and Belgium having ceased, and it is a matter of importance to British users to see what is going to happen under peace conditions. A rise from £2 to £8 is no trifle, as the principal users who are in the paint trade have found. The main facts as regards British production are that there is plenty of the raw material at home and that the output has increased by about 30,000 tons in the last three years. A large amount of this was used in the rough for lithopone manufacture, a material for which the large demand in the rubber trade has now declined. A large number of new mines have been started and several new grinding mills put up. Only a certain proportion of the British output is the best white quality and the makers are apprehensive that they will not be able to keep their present profitable business unless they are secured by tariff against foreign imports. The paint trade and possibly the rubber trade are not so keen against foreign competition and as far as I can judge the situation the authorities are inclined to conjure the British producers to see if they cannot manage to meet foreign competition better than they did before the war, especially if improved transport facilities become available. This barytes question, of course, is only one of many industries in which producers have for the first time formed themselves into an association for the furtherance or protection of their interests and which interests are not those of the consumer of these products.

TIRE IMPORTS IN BRITISH SOUTH AFRICA.

During 1917, tires were supplied to British South Africa by the United Kingdom of a value of $1,374,227, Great Britain being the principal source of supply, with 53 per cent of the total imports to its credit. Imports from the United States increased from $692,114, in 1916, to $705,681, in 1917, and a material gain resulted to French and Italian manufacturers, imports of their goods increased by 71 per cent compared with the figures of 1916.

VENEZUELAN BALATA EXPORTS IN 1917.

During the second half of 1917, balata ranked fourth in value among the products exported from Venezuela, the total amounting to 3,719,633 bolivars, equivalent to $717,889.17 in United States currency, a bolivar amounting to $0.193.

LATEX-COLLECTING CUPS.

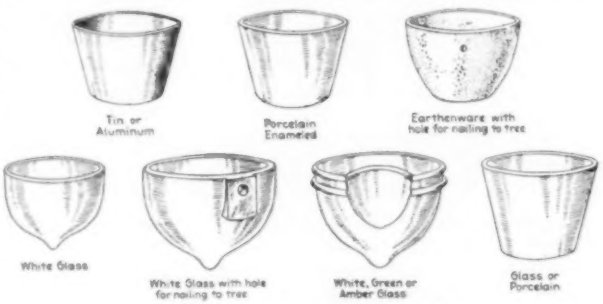
IN the development of the plantation rubber industry, quality of product is recognized as an important factor in the realization of profits. This has led to the utilization of carefully devised tools, machinery, and methods for every phase of the working processes, from the latex to the finished material packed for export to the rubber goods manufacturer.

In the scheme of development the simple latex cup employed at the tree for collecting the latex, has received considerable attention. Satisfactory latex cups are now obtainable, principally of English manufacture, in a variety of forms, dimensions, and materials.

VARIETIES OF CUPS.

The forms are commonly circular with tapered sides, to admit "nesting," and have inside rounded bottom.

Some are convex tapered and others are oval like the blossom end of a half lemon. Some forms show a flattened or inwardly



TYPES OF LATEX-COLLECTING CUPS.

curved surface on one side for close accommodation to the tree trunk, and others are provided with a hole for nailing to the tree.

The dimensions are variable from three to four inches in diameter. The porcelain cup used on certain large estates has the following measurements: diameter of top, four inches; diameter of bottom, 2½ inches; depth, three inches; thickness of wall, ⅛-inch. The materials from which latex cups are made are tin, iron, aluminum, glass, porcelain, and earthenware.

In use the cups to receive the latex flow rest on the ground under the spout or are supported against the tree by a wire or cord encircling both cup and tree trunk. Many estates have the initials of the company on the outside surface of their cups. Prominent among many different styles and sizes of cups used in the Far East may be mentioned the half-round porcelain form. This cup is four inches across the top and two inches deep, with ⅛-inch walls and flat outside bottom to prevent its overturning when placed on the ground.

METHOD OF USE.

The method of using the latex cup varies on different estates. As received, cups come in boxes containing about 500. They are unpacked, inspected, and marked at the coagulating station. The cups, when distributed to the different trees, one for each, are hung on a piece of wire from the tree, or on top of a sharp-pointed stick stuck in the ground near by. After the tapping cut has been made the cup is placed underneath the sheet metal spout, either on the ground if the tapping is low or on wire formed into a loop encircling the tree.

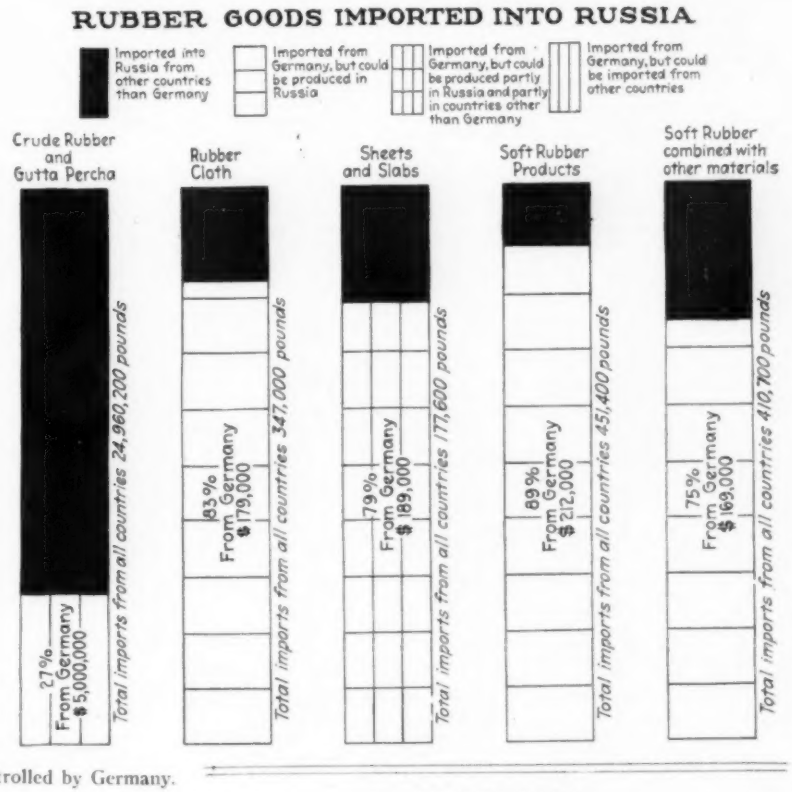
The latex thus collected in the cup is emptied out and as much as possible removed with a squilgee. The cup is then washed in clean water and returned to the wire holder, or pointed stick, with the mouth down.

Several American concerns have recently given their attention to the manufacture of latex cups for which there is a large demand from rubber planters.

Russian Trade Possibilities.

AN eminent Russian authority on economics, Professor Joseph M. Goldstein, of the Moscow High Institute of Commerce and Industry, and of the University of Moscow, stated seventeen years ago in a report to Count Witte that if Russia did not radically change her foreign policy she would become, in effect, a German colony. Previous to the present war this result had actually taken place as shown by Germany's preponderating control of Russia's import trade in all classes of manufactures. Previous to 1914 Russian import trade amounted to $600,000,000 annually and official statistics indicate that Germany was constantly gaining increasing control of this trade. Now with the country disorganized, Russia's imports will amount to $1,500,000. Here is a magnificent opportunity for the Allies to free Russia from German economic domination on a purely business basis.

In the statistics presented by Professor Goldstein, those of interest to American rubber manufacturers include the following classifications, representing the total rubber and rubber goods importations by Russia for 1913 and the large proportion controlled by Germany.



	Total Pounds Imported from All Countries.	Imported From Germany. Per Cent.	Value.
Crude rubber and gutta percha....	24,960,200	27	$5,000,000
Rubber cloth	347,800	83	179,000
Soft rubber sheets and slabs.....	177,600	79	189,000
Products of soft rubber.....	451,400	89	212,000
Soft rubber combined with other materials	410,700	75	169,000
Totals	26,347,700		$5,749,009

In the case of machinery in which rubber is component or accessory the figures are as follows:

	Total Pounds Imported from All Countries.	Imported From Germany. Per Cent.	Value.
Threshers, etc	284,000	32	$252,000
Locomotives and motor wagons....	64,400	94	320,000
Typewriters	23,100	64	450,000
Cycles (2 wheel)	18,900	85	724,000
Motor cycles	1,500	80	175,000
Automobiles	3,300	79	4,740,000
Totals	395,200		$6,661,000

In the matter of certain minerals and chemicals, Germany's trade with Russia averaged 71 per cent of the total in those lines in 1913 and aggregated a value of $1,719,000. The materials referred to included tars, pitches, asphalt, mineral wax, paraffine, sulphur, sulphuric acid, bisulphide of carbon, benzol, aniline and caustic soda. These are all utilized to greater or lesser extent in rubber manufacture as well as in other lines.

Russia will have need to import manufactured goods for an indefinitely long time, and it is imperatively necessary for the world's security that Germany be prevented from gaining economic control of Russia.

CEYLON RUBBER.

In 1908 the shipments of Ceylon rubber amounted to less than a million pounds; nine years later, in 1917, the figure increased to over 75,000,000 pounds, exceeding the previous record year of 1916 by nearly 30 per cent, compared with the increase in value of approximately 23 per cent.

Average rubber prices for the five years 1913 to 1917 were as follows: $0.62 per pound in 1913, $0.46 in 1914, $0.54 in 1915, $0.58 in 1916, and $0.48 in 1917. Owing to the disclocation of exchange the first rubber auction in the chamber of commerce rooms was not held until February 23, and then payment was in London sterling drafts instead of Indian rupees. This condition of payment prevailed at all the sales throughout the year. There was, however, a fair amount of business done in private sales. First quality crêpe opened at $0.58, advancing steadily to $0.68 per pound by April. Prices then declined until the beginning of August, when first-quality crêpe auctioned at $0.47 per pound. In November the price recovered to $0.52, but in December it again fell, until the highest price paid was $0.40 per pound. For the first three months of the year crêpe had an advantage of about $0.03; in April prices were about the same; in May smoked sheets were relatively a cent higher; in August they reached a point of about $0.03 higher; but during the rest of the year crêpe was level with or higher than sheets.

The United States and United Kingdom took approximately equal shares of Ceylon-grown rubber, the two countries consuming close to 95 per cent of the colony's entire rubber production. (Commerce Reports Supplement, December 17, 1918.)

Recent Patents Relating to Rubber.

THE UNITED STATES.

ISSUED DECEMBER 10, 1918.

No. 1,287,008. Doll's hand with fingers actuated by rubber band threaded through interior passages. M. R. Harrison, New York City.

1,287,114. Respirator. J. Saracino, Laporte, Ind.

1,287,149. Anesthetic mask. W. P. Walter and D. G. McCurdy, Evanston, assignors by mesne assignments to Safety Anaesthesia Apparatus Concern, Chicago—both in Ill.

1,287,176. Exercising dummy device with inflated body. W. P. Armstrong, Washington, D. C.

1,287,276. Demountable rim for tires. C. W. Foster, Chloride, Ariz.

1,287,284. Guide-fin structure for balloons. J. R. Gammeter, Akron, O., assignor to The B. F. Goodrich Co., New York City.

1,287,285. Stuffing-box for balloon cords. J. R. Gammeter, Akron, O., assignor to The B. F. Goodrich Co., New York City.

1,287,288. Pocket drinking cup. S. R. Gayton, assignor of ¼ to M. R. Clark—both of Philadelphia, Pa.

1,287,295. Baby pacifier. H. F. Guenther, Cleveland, O.

1,287,404. Teat-cup for milking-machine. C. Oden and J. G. G. Eklundh, assignors to The Universal Milking Machine Co.—all of Columbus, O.

1,287,423. Dust cap for inflating valves, with soft-rubber gripper. R. M. Pierson, Akron, O., assignor to The B. F. Goodrich Co., New York City.

1,287,475. Hose supporter. W. A. Simmons, St. Louis, Mo.

1,287,490. Tube connection for hot-water bottles. W. B. and V. D. Smith, Detroit, Mich.

1,287,511. Wind-shield wiper. P. W. Swan, North Yakima, Wash.

1,287,556. Fountain pen. E. G. Woody, Brooklyn, N. Y.

REISSUES.

14,564. Inner tube for neumatic tires. J. P. Brophy, assignor to Pneumatic Cushion Inner Tube Co.—both of Boston, Mass. Original No. 1,208,906, December 19, 1916.

ISSUED DECEMBER 17, 1918.

1,287,658. Electric miring cable. C. R. Evans, Akron, O., assignor to The B. F. Goodrich Co., New York City.

1,287,694. Tire with core designed to prevent rim-cutting. O. L. Huffman, Weatherford, Tex.

1,287,702. Match-box combined with tobacco container of rubberized fabric. J. La Follette, Pringle, S. D.

1,287,708. Lock for demountable rims. O. Le Beau, Montreal, Que., Can.

1,287,724. Demountable rim. W. M. Marseilles, Clinton, Mo.

1,287,666. Rubber tennis ball. A. T. Saunders, Chicopee, Mass., assignor to A. G. Spalding & Bros., Jersey City, N. J.

1,287,779. Rubber-band-operated figure toy. F. R. Springer, Chicago, Ill.

1,287,802. Cushioned wheel. G. Walther, Dayton, O.

1,287,909. Fountain pen. N. R. Dennis, Ensley, Ala.

1,287,948. Rubber vacuum cup for holding wash-board legs in place. M. C. Frank, Piedmont, Calif.

1,287,951. Pneumatic tire. A. L. Fry and F. C. Nagel, Seward, Neb.

1,288,061. Hot-water bottle. A. H. Leighton, McMinnville, Ore.

1,288,097. Air-valve and method of manufacture. C. V. Martin, Norwalk, O.

1,288,109. Resilient protector for pneumatic tires. S. F. Millard, Norwalk, Conn.

1,288,148. Hose coupling. J. M. Oden, Brooklyn, N. Y.

1,288,155. Dust guard for pneumatic tire valves. M. F. Patton, Tuscaloosa, Ala., assignor to A. Schrader's Son, Inc., Brooklyn, N. Y.

1,288,161. Sectional tire. W. W. Perryclear, Savannah, Ga., assignor of ½ to L. W. High, Wilson, N. C.

1,288,204. Hose clamp. A. Roscetta, Jerome, Ariz.

1,288,231. Vacuum cup support. T. R. Seglem, Duluth, Minn.

1,288,415. Pneumatic tire. V. K. Hober, Fredonia, N. Y.

1,288,445. Pneumatic seat for motorcycles, etc. H. Seibel, Los Angeles, Calif., assignor to United Air Spring Co. of Arizona, Phoenix, Ariz.

1,288,446. Pneumatic seat for motorcycles, etc. H. Seibel, Los Angeles, Calif., assignor to United Air Spring Co. of Arizona, Phoenix, Ariz.

1,288,447. Pneumatic support for motorcycle seats, etc. H. Seibel, Los Angeles, Calif., assignor to United Air Spring Co. of Arizona, Phoenix, Ariz.

1,288,451. Kite, captive, or observation balloon with inflatable tail portions. C. F. Smyth, assignor to Connecticut Aircraft Co.—both of New Haven, Conn.

1,288,457. Life-saving suit. Takeji Hattori, Fellows, Calif.

ISSUED DECEMBER 24, 1918.

1,288,528. Wheel rim for tires. F. L. Darling, Long Beach, Calif.

1,288,647. Respirator mask. F. L. Miller, Idaho Springs, Colo.

1,288,687. Garment supporter. A. F. Sager, Milwaukee, Wis.

1,288,725. Cream remover. B. G. Somerville, Bronx, N. Y.

1,288,766. Cap and clip for fountain pen. H. J. Upton, Medford, Mass.

1,288,919. Fountain pen. G. F. Brandt, assignor to Moore Pen Co.—both of Boston, Mass.

1,288,922. Tire rim. R. S. Bryant, assignor to The Standard Parts Co.—both of Cleveland, O.

1,288,848. Catamenial sack with elastic inserts. C. E. Dudley, Philadelphia, Pa.

1,288,950. Oxygen-inhaling device. H. E. Easly, Waterloo, Ia.

1,288,856. Respirator. L. Farr, El Portal, Calif.

1,288,857. Life preserver with inflatable air-containers. L. Farr, El Portal, Calif.

1,288,865. Waterproof coat. C. F. H. Freese, Pittsfield, N. H., assignor to Globe Manufacturing Co., a corporation of New Hampshire.

1,288,949. Rubber-tired caster wheel. E. T. Malloy, assignor to The American Caster Co.—both of Hamilton, O.

1,288,960. Armored pneumatic tire. P. J. Mix, assignor of ½ to D. E. Hoagland—both of Boulder, Colo.

REISSUES.

14,577. Rubber and fiber composition shoe sole. L. F. Montgomery, Fort Recovery, assignor of ½ to J. E. Grosjean and ¼ to F. L. Maire, both of Lima—all in Ohio. Original No. 1,212,985, January 16, 1917.

14,579. Dust cap for valve stems. C. T. Shaffer, San Francisco, Calif., assignor by mesne assignments to A. Schrader's Son, Inc., Brooklyn, N. Y. Original No. 1,191,840, July 18, 1916.

ISSUED DECEMBER 31, 1918.

1,289,106 Rubber-shoe sole with slip-resisting pockets and ribs. H. Bullock, Andover, assignor to Converse Rubber Shoe Co., Malden—both in Mass.

1,289,231. Garter for knickerbockers. V. L. Munro, Highland Park, Ill.

1,289,269. Umbrella cover with elastic end. W. W. Rucker, Portland, Ore.

1,289,445. Shoe heel. V. B. Greco, Waterloo, Ia.

1,289,463. Puncture-proof pneumatic tire. D. F. Hervey, Logansport, Ind.

1,289,476. Life-preserver suit. L. V. Keviczky, New York City.

1,289,478. Automobile tire. J. Kozak, Milwaukee, Wis.

1,289,586. Cushion wheel. M. T. Weston, New York City.

1,289,630. Demountable tire rim. E. R. Bresler, Amanda, O.

1,289,647. Wind-shield wiper. J. W. Cain, Chicago, Ill.

1,289,662. Improved rubber-shoe sole. M. H. Clark, Hastings-upon-Hudson, N. Y., assignor to Goodyear's Metallic Rubber Shoe Co., Naugatuck, Conn.

1,289,706. Nipple for nursing bottle. W. J. Eggers; Mary J. Eggers, administratrix of W. J. Eggers, deceased, Brooklyn, N. Y.

1,289,754. Clincher rim for tires. E. Hayes, Brooklyn, assignor of ⅗ to Hayes-Diefenderfer Co., Inc., New York City, both in New York, and ⅕ to G. B. Pickop, New Haven, Conn.

1,289,839. Life-saving garment. E. M. Lowy, assignor to Lowy Life Saving Suit Corp.—both of New York City.

1,289,921. Fountain pen. S. M. Rowe, assignor of 3/10 to L. R. Shafer—both of Cincinnati, O.

1,289,929. Automobile tire. E. G. Schleicher, Stamford, Conn.

1,289,958. Rim for pneumatic tires. B. Tamburello, New York City.

ISSUED JANUARY 7, 1919.

1,290,095. Shoe heel. E. M. Cook, Oberlin, O.

1,290,113. Spring tire with rubber tread. V. Deisenhofer, Chicago, Ill.

1,290,128. Quick tire-patch for pneumatic tires. C. O. Duffy, Dallas, Tex.

1,290,159. Pad for typewriter feet, with rubber plug. S. Foster, Porto Bello, Jamaica, B. W. I.

1,290,211. Demountable rim for automobile tires. J. L. Jensen, Cowley, Wyo.

1,290,243. Valve for pneumatic tires. I. Kornetsky, Chelsea, and D. P. Sullivan, Boston—both in Mass.

1,290,365. Self-filling fountain pen. F. Scheiblecker, assignor to Salz Brothers—both of New York City.

1,290,426. Bicycle saddle with air cushions. A. P. van Leuven, The Hague, Netherlands.

1,290,453. Resilient cushioned tire. J. S. Williams, Philadelphia, Pa.

1,290,464. Wind-shield cleaner. S. C. Wolfe, Angola, Ind.

1,290,519. Resilient wheel with pneumatic tubes. J. T. Cowan, Pittsburgh, Pa.

1,290,534. Device for filling fountain pens. P. P. Flournoy, Bethesda, Md.

1,290,545. Fountain pen, with ink-tablet container. W. Greaves, Almeda, Calif.

1,290,556. Demountable rim for tires. C. St. Hilaire, Gardner, Mass.

1,290,582. Tire valve. H. P. Kraft, Ridgewood, N. J. (Original application divided.)

1,290,608. Brassière with elastic inserts. E. H. Lowman, Los Angeles, Calif.

1,290,630. Sectional tire casing. C. V. Merling, Centralia, Wash.

1,290,677. Garment supporter. H. J. Stuart, Derby, assignor to Robert N. Bassett Co., Inc., Shelton—both in Conn.

1,290,678. Hose-supporter button. H. J. Stuart, Derby, assignor to Robert N. Bassett Co., Inc., Shelton—both in Conn.

1,290,693. Rubber heel. G. M. Anderson, Washington, D. C.

1,290,774. Shoe heel with elastic body. F. A. Nolan, St. Paul, Minn.

THE DOMINION OF CANADA.

PUBLISHED NOVEMBER 30, 1918.

187,333. Shock absorber for aircraft. The Curtiss Aeroplane and Motor Corp., Buffalo, assignee of Nelson W. Dalton, Garden City, Long Island, N. Y., U. S. A.

187,336. Chewing gum. The Ellis-Foster Co., Montclair, assignee of Harry Maximilian Weber, East Orange—both in N. J., U. S. A.

Chemical Patents will be found on pages 304 and 305. Machinery Patents on page 307.

187,397. Nipple for nursing bottles. M. C. B. Poore, née Buchanan, Boston, Mass., U. S. A.
187,449. Wheel with pneumatic cushion between bushing and rim. J. Greppi and A. Romanach, co-inventors, both of Buenos Aires, Argentina.
187,470. Reinforced tire casing. A. H. Gruber, Evanston, Ill.
187,565. Detachable rubber heel with washers for locking into position. Laver's Heels Patents, Limited, assignee of C. W. Lavers, both of Halifax, Nova Scotia.
187,566. Detachable rubber heel having slotted plate embedded therein for attaching to permanent boot or shoe heel. Lavers Heels Patents, Limited, assignee of C. W. Lavers, both of Halifax, Nova Scotia.
187,574. Machine packing made of rubber-impregnated canvas derived from waste vehicle tires. G. W. Beldam, Ealing, Middlesex, England.
187,597. Rubber foot with vacuum cup for holding washboard in place. M. C. Frank, Piedmont, Calif., U. S. A.
187,646. Fountain-pen cap and clip. The Conklin Pen Manufacturing Co., Toledo, O., assignee of F. H. Mooney, Hindsdale, Ill., U. S. A.
187,656. Rim for vehicle wheels. The Standard Parts Co., assignee of O. H. Jobski, administrator—both of Cleveland, O., U. S. A.
187,674. Sole protector made of combined vulcanized fiber, rubber, etc. F. Marsh, Leeds, assignor, W. Hey and J. W. Meadowcroft, both of York, each an assignee of 1/3 interest—all in England.

THE UNITED KINGDOM.

ISSUED DECEMBER 30, 1918.

120,106. Removable rubber pads for crutches, etc. F. C. Lynde, 51 King street, Manchester.
120,109. Hair-trimmer or safety razor, made of vulcanite, or similar substance. A. J. Mainwaring, 4 Park Place, St. James', London.
120,117. Rubber pads for crutches, etc. F. C. Lynder, 51 King street, Manchester.
120,148. Binder for attaching rubber pipe to metal pipe. W. H Clegg, 136 Browhead Road, Burnley.
120,162. Rubber mock for supporting cross-piece of crutches. J. Curwood, Maxwelton, New Road, Littlehampton, Sussex.

ISSUED DECEMBER 31, 1918.

120,297. Rubber sole reinforced by canvas, wire, etc. F. Creassey, Upper Parliament street, Nottingham.
120,336. Electric insulators. H. Wade, 111 Hatton Garden, London. (Societa Metallurgica Italiana, Leghorn, Italy.)
120,374. Tire cover. Berendonck's Section Tyre Syndicate, 16 Valerinsplein, Amsterdam. (Not yet accepted.)

ISSUED JANUARY 8, 1919.

120,462. Inflatable bag for artificial foot. P. and R. Schranz, 66 Margaret street, Oxford Circus, London.
120,485. Rubber-insulated electric cables. C. J. Beaver, Rangemoor, Crescent Road, Hale, and E. A. Claremont, Broom Cottage, High Legh—both in Cheshire. (Addition to No. 114,872.)

ISSUED JANUARY 15, 1919.

120,589. Solid composite rubber tires. Dunlop Rubber Co. and J. V. Worthington, 14 Regent street, Westminster.
120,603. Fluid-tight joint for staying control-cord of gas-envelope valve. H. Lord, 1 Chelmsford street, Coppice, Oldham.
120,604. Pneumatic arm rests for crutches. F. A. Pennington, 10 Halesden Road, Heaton Chapel, Stockport, and T. R. Day, Bankfield, Davyhulme—both in Cheshire.
120,658. Golf ball. W. J. Mellersh-Jackson, 28 Southampton Buildings, London. (Revere Rubber Co., 59 Reade street, New York City, U. S. A.)
120,667. Rubber-lined clip for repairing burst water pipes, etc. E. Hanff, 71 Hatherley street, Princes Park, Liverpool.
120,693. Apparatus for producing corrugated roofing tiles, with rubber wiper rolls. J. Adams, 80 Dover Road, Northfleet, Kent.
120,707. Outer sole for shoe, with staggered apertures for rubber inserts. A. G. Knight, 9 Mount Nod Road, Streatham Hill, London.
120,751. Puncture-preventing rubber and vulcanite band for pneumatic tires. J. E. Dysart, Cadiz, O.

ISSUED JANUARY 22, 1919.

120,837. Stuffing-box substitutes, with rubber diaphragm. W. E. Savery, Ivy Bank, Middleton Hall Road, King's Norton, Birmingham.
120,864. Plastic composition for artificial limbs, toys, etc., having elastic strips molded therein for operating. F. E. Eaton, 27 Newtown avenue, Blackrock, County Dublin.
120,874. Artificial feet with rubber cushions between parts. J. F. Rowley, 25 West Madison street, Chicago, Ill., U. S. A.
120,962. Electric cables with rubber sheath. W. T. Henley's Telegraph Works Co., 13 Blomfield street, London Wall, and H. Savage, 77 Westcombe Park Road, Blackheath, both in London.

ISSUED JANUARY 29, 1919.

120,979. Tire tread composed of flexible metal band vulcanized to tread of solid rubber tire. H. L. Harding, Hill View, Queen's Road, Loughton, Essex.
121,028. Rubber reservoir nib for pens. H. Swann, Upper Court, Kemerton, near Tewkesbury.
121,043. Attachable soles, heels, etc., made by vulcanizing a layer of rubber or rubber substitute on to a foundation of waste canvas from tire covers or waste balata.
121,044. Electric insulator with rubber washer. W. A. Davis, 48 King's Gardens, West End Lane, London.
121,051. Rubber pad for protecting boots, etc., with studs to permit attachment. H. T. Stephens, Tahoona, Ferryside, Carmathenshire.
121,067. Abdominal belt with elastic sections. F. G. Baugatz, 37 Boulevard des Capucines, Paris, France.
121,110. Saw-tooth non-slipping resilient heel. B. W. Brockett, 2824 Corydon Road, Cleveland Heights, Ohio, U. S. A.
121,143. Rubber-disk suction device for artificial dentures. A. W. Fisher, Bryn Estyn, Whitchurch, Shropshire.
121,190. Container for paste, etc., having rubber cap perforated to admit air. F. M. Upward, 86 Estcourt Road, Woodside, London.

THE FRENCH REPUBLIC.

PATENTS ISSUED (WITH DATES OF APPLICATION).

488,459. (January 17, 1918.) Adaptation of an air chamber in all the sockets of artificial legs. P. Jacquenim.
488,474. (January 18, 1918.) Wheel with rubber hub for vehicles in general and motor trucks in particular. Savoia Pietro del fu Luigi & Co.
488,564. (July 9, 1917.) Improvements in the manufacture of airplane parts. Goodyear's India Rubber Glove Manufacturing Co., Naugatuck, Conn., U. S. A.
488,610. (January 25, 1918.) Improvements in pneumatic tires to permit inflation while in motion. P. O. J. Knerdsen.
488,643. (May 14, 1915.) Insulating glove. Société Anonyme des Etablissements Hutchison.
488,701. (January 30, 1918.) Improvements in resilient wheels. J. L. Harden.
488,726. (February 1, 1918.) Life-saving costume. C. J. E. Chamion.
488,791. (February 5, 1918.) Improvements in rubber pads for horse shoes. E. Linfield, W. H. Goldfinch and A. W. Capener.
488,797. (February 21, 1918.) Portable insubmersible apparatus for walking on water. L. Risso.
488,816. (February 6, 1918.) Improvements in fittings for horse shoes. B. P. Gray.

NEW ZEALAND.

ISSUED DECEMBER 12, 1918.

39,567. Tire puncture composition. Puncture Cure, Limited, 117 8th avenue west, assignee of E. Campbell and F. Cashman—all of Calgary, Alta., Can.

TRADE MARKS.

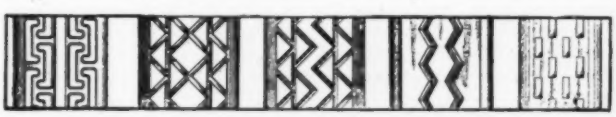
THE UNITED STATES.

NO. 99,035. The word SANATINE—chewing gum and chewing gum covered with candy. Frank H. Fleer Corp., Philadelphia, Pa.
105,141. The representation of a bell bearing the slogan 2 IN 1—retreaded rubber and fabric tires, the retread being of rubber and fabric. Bell 2 in 1 Tire Co., Richmond, Va.
106,670. The word COMFY superimposed on one end of a double-outlined diamond—folding containers of waterproof cloth, etc. E. B. Nathan, New York City.
108,905. The word TANZOLE within a concave four-sided geometrical figure. W. C. Walsh, Philadelphia, Pa.
110,830. The words THE VICTOR—rubber and fabric outer casings for automobile tires and inner tubes. The Victor Rubber Co., Springfield, O.
111,161. The words CHEARGYL LUNKUR—inspirators. J. B. Neuburger, New York City.
111,268. The words EVER-GRIP above the representation of an eagle within a circle—repair patches for tires, inner tubes, and other rubber goods. P. Hoerr, Peoria, Ill.
111,964. Represenation of an arrow passing from left to right across the word HOOD—rubber boots, shoes, and overshoes, and rubber-soled canvas shoes. Hood Rubber Co., Watertown, Mass.
111,965. Same as No. 111,964—rubber cushion and pneumatic tires and tubes, and tire-repair patches or reinforcements. Hood Rubber Co., Watertown, Mass.
112,333. The letters B B C—rubber or rubber and fabric tires and tubes. The Brunswick-Balke-Collender Co., Wilmington, Del., and Chicago, Ill.
112,339. The words OVER THE TOP—waterproof cotton fabrics. The Landers Brothers Co., Toledo, O.
113,043. The representation within a rectangle of a flask and liqueur glass beside the word TREES, each letter of the word being inclosed with circles graduated in size—chewing gum. S. Zimetbaum, New York City.
113,075. The word BANNER, the first part being in outlined letters and the second shaded—electric insulated weatherproof wires and friction tape. Central Electric Co., Chicago, Ill.
114,095. The word DIAMOND—masks and respirators. The Hygeia Respirator Co., Passaic, N. J.
114,165. The words ASBESTO-SPONGE—boiler and pipe covering. H. W. Johns-Manville Co., New York City.

DESIGNS.

THE UNITED STATES.

NO. 52,725. Tire. Patented December 10, 1918. Term 14 years. J. F. Arnold, assignor to Dunlop Tire and Rubber Goods Co., Limited—both of Toronto, Ont., Can.
52,731. Tire. Patented December 10, 1918. Term 14 years. T. J. Edwards, Akron, O.



52,725. 52,731. 52,732. 52,749. 58,822.

52,732. Tire. Patented December 10, 1918. Term 14 years. T. J. Edwards, Akron, O.
52,749. Pneumatic tire. Patented December 10, 1918. Term 14 years. C. L. Landon, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.
52,822. Pneumatic tire. Patented December 31, 1918. Term 14 years. H. H. Hazeltine, Tacoma, Wash.

The London View of the 1918 Market.

THE YEAR 1918 witnessed a complete upset of the normal development of crude rubber supply and demand. The trade had not foreseen how America's part in the war would restrict imports and curtail consumption of crude rubber, and especially that it would so drastically reduce the production of automobiles and pneumatic tires; but, notwithstanding the effort to curtail all plantation production correspondingly, the world's available stocks to-day are greater than ever before. Although the demands for war purposes were large, America probably used no more than two-thirds of the 1917 consumption, being helped by the large stocks there and afloat. The absence of the Russian demand added to the reduced consumption, and Germany and Austria can have had little to use.

The total visible supply of crude rubber on December 31 was estimated at about 87,000 tons, 7,000 tons afloat and 80,000 tons in British, American, East Russian and Middle Eastern stocks, or about 56,500 tons more than at the end of 1917. British stocks on December 31 totaled 19,000 tons, of which about 18,000 tons were plantation sorts. British imports and deliveries of all sorts for the year were only 42,800 and 39,461 tons, respectively, against 67,036 and 64,668 tons in 1917. Of these amounts 37,456 and 34,800 tons, respectively, were other than Pará and Peruvian.

With all American restrictions on the manufacture of motor vehicles and tires now removed; with the passenger-car market returning to normal, and the demand for trucks and solid tires greater than ever; with a world shortage of rubber goods of every sort; with the shipping situation constantly improving, the prospect for 1919 is much brighter. Pre-war conditions will gradually be reestablished, and this is believed to apply to the packing of rubber as well as many other matters.

The close press packing of plantation rubber to make a case contain greater weight, introduced partially in the late autumn, does not suit the European market and is liable to cause deterioration of the rubber. Bales are also objected to. Strong, planed wood cases of 1½-hundredweight size are preferred, especially for sheets, which should be carefully packed laid flat, not folded.

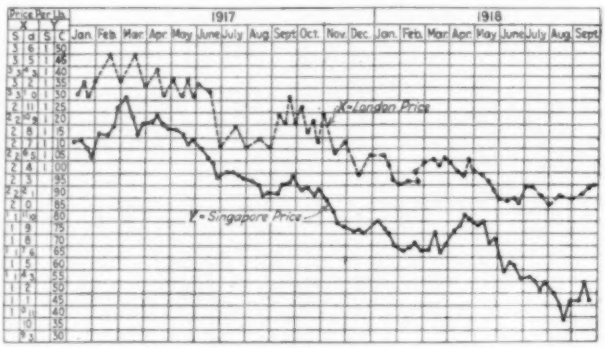
THE MARKET.

At the beginning of the year plantation rubbers were very close to their highest levels. In January standard crêpe ranged from 2*s.* 3*d.* to 2*s.* 6¼*d.* and smoked sheet from 2*s.* 2½*d.* to 2*s.* 5¾*d.* In March crêpe brought as high as 2*s.* 6½*d.* and sheet 2*s.* 5¾*d.* Thereafter occurred a gradual decline with minor fluctuations until in August standard crêpe dropped as low as 2*s.* 1*d.* and smoked sheet as low as 2*s.* An upward tendency then developed and continued until November, when crêpe sold as high as 2*s.* 6*d.* and sheet as high as 2*s.* 5*d.* December quotations, however, ranged from 2*s.* 2½*d.* to 2*s.* 4*d.* for standard crêpe, and from 2*s.* 1½*d.* to 2*s.* 3¼*d.* for smoked sheet in response to the easing of shipping conditions following the signing of the armistice and the knowledge of accumulating stocks at Eastern shipping points.

February and March afforded opportunities to make sales at good prices, as unwise speculators forced prices up at one time to 2*s.* 8½*d.* forward, resulting in many losses to buyers. But estates took little advantage of making considerable sales forward. Although shipping facilities were uncertain, undue nervousness was shown in making forward sales, and good orders in the spring for forward delivery in the East and London were not executed, or only to a very limited degree.

In June came unforeseen the decision of America to reduce its importation and consumption of rubber by one-half. The effect of this was greatly increased by the fact that planters had sold such a small part of the 1918 crop for forward delivery. Prices were forced down; a glut of rubber in the East, despite the efforts of the Rubber Growers' Association to stabilize the market by curtailment of production, aided the depression, and large sales at ridiculously low prices were made in the East—as low as 10½*d.* ex go-down for rubber now worth 1*s.* 9½*d.*

London brokers, well versed in the entire trade, believe this panic could have been averted had they been employed with confidence by the trade. They regard it as another proof that more concentration of trade through London channels of selling will secure a higher return to planters, is to the great advantage of estates, and will be more so. Such a large and growing trade,



(Malayan Tin & Rubber Journal.)

CRUDE RUBBER TOP PRICES IN LONDON AND SINGAPORE FROM JANUARY, 1917, TO SEPTEMBER, 1918.

they assert, must be conducted by larger sales of the succeeding year's crop; moreover, greater readiness to sell when there are eager buyers will result to the benefit of planters by giving large, long-established dealers a greater interest. Now that the war is over they point out that rubber can be readily distributed from England to all parts of the world and that larger London stocks need cause no alarm, either on the score of dock space, finance, or fear of deterioration of the rubber held in large stocks. It is commonly said that "the absurd restriction of exports" from England must cease.

Prices of Pará rubber have been well sustained and have shown a considerable premium over plantations. However, the large daily supply of the latter from the Middle East, sold forward or on arrival has naturally affected the demand for all Brazilian grades. Imports of medium descriptions have generally fallen off. For certain grades a fair demand has prevailed, but inferior, soft, weak rubbers have sold with difficulty at low prices. The demand for caucho ball has greatly declined and the price is much lower.

In January hard fine Pará ranged from 2*s.* 7¾*d.* to 2*s.* 9¼*d.* and in February sold as low as 2*s.* 6¼*d.* Then occurred a gradual rise until in September it ranged from 3*s.* 2½*d.* to 3*s.* 8*d.* followed by a decline until in December it ranged from 2*s.* 7*d.* to 2*s.* 9½*d.*

The following closing prices for recent years are of interest:

	Hard Fine Pará	Negrohead Scrappy.	Negrohead Island.	Caucho Ball.
1914.....	2*s.* 10¾*d.*	2*s.* 1½*d.*	1*s.* 3*d.*	2*s.* 4*d.*
1915.....	3*s.* 9*d.*	2*s.* 10*d.*	1*s.* 7*d.*	3*s.*
1916.....	3*s.* 3*d.*	1*s.* 11*d.*	1*s.* 3*d.*	2*s.* 2*d.*
1917.....	2*s.* 8½*d.*	1*s.* 5*d.*	1*s.*	1*s.* 6½*d.*
1918.....	2*s.* 7*d.*	1*s.* 7*d.*	1*s.*	1*s.* 8*d.*

Balata was in less supply and good demand throughout the year, closing at 4*s.* ½*d.* for sheet and 3*s.* 6½*d.* for block. Good qualities of gutta percha realized high prices and at one time jelutong prices were more than doubled, present quotations being about £40 c. i. f.

THE WORLD'S PRODUCTION.

The world's production of crude rubber of all grades for the year 1918 is estimated by authorities at about 257,000 tons. The amount would have been much greater but for curtailed production made necessary by the continued diversion of ship tonnage from normal business to war transport. The following table shows the total production of crude rubber for the last three years:

	1918.	1917.	1916.
Ceylon and India ..... *tons*	23,000	25,000	24,500
Malaya, Dutch East India, etc.....	190,600	165,000	105,500
Amazonas (Brazil, Bolivia).....	26,000	31,771	28,255
Peruvian and Caucho.....	8,400	9,729	8,245
West Coast, Africa.....			
Benguela and Mossamedes	3,200	3,000	2,000
Loanda			
Congo, French Congo and Soudan.....	3,200	3,500	5,000
From other sources.....	2,600	2,500	4,500
Totals	257,000	240,500[1]	178,000[1]

[1]Underestimated.

The production of South American rubber was considerably decreased. Bolivia sent less; Mollendo and Venezuela via the Orinocó, none; Ceara, Maniçoba, Pernambuco, Assare, Mangabeira, very little; Mattogrosso, much less. Central America, including Nicaragua, Colombia and Ecuador, exported very little rubber: Mexico almost nothing, other than guayule rubber. Decreased amounts have been received from the West Coast of Africa especially Congo and Soudan, but good qualities sold well from the Niger, Gold Coast, Accra, etc., Cameroons, Sierra Leone, Gaboon, Conakry, French Congo and Soudan. Exports of lump have been much loss. Very little rubber came from East Africa, Madagascar and Abyssinia. British and former German East Africa sent very little *Manihot* rubber; Zanzibar, scarcely any red rubber; Nyassaland and New Guinea, none. Penang reduced its supply of wild rubber, also Rangoon and Assam. Java, Sumatra and Borneo exported much less Rambong rubber but more *Hevea*. Amounts coming from Toulsin and Cochin China were very small.

The following table shows the annual receipts and shipments at Pará for the last three years:

	1918.	1917.	1916.
Receipts of Pará..... *tons*	23,000	29,759	28,260
Receipts of Peruvian	8,600	9,591	8,245
Shipments of Pará and Peruvian to Europe	6,035	14,320	12,045
Shipments of Pará and Peruvian to America	19,350	25,950	22,185

PLANTATION RUBBER.

Owing to increased production capacity of plantations and curtailed consumption of crude rubber resulting from the war, also because of labor shortages and the high cost of estate operations, less than 100,000 planted acres were added to the total during 1918. All of the principal plantation rubber countries of the Middle East have made some progress, with the exception of the former German colonies, where, largely through neglect, the effective acreage has decreased to two-thirds of what it was in 1916.

Plantations, chiefly of *Castilloa*, in Mexico, West Indies and Central and South America have shown no progress and the yields have been insignificant. The same is true of Ceara plantations in East Africa. Plantations in India, Burma and the Mergui are being extended.

The approximate plantation acreages for three years past follow:

	1918.	1917.	1916.
Ceylon ..... *acres*	300,000	290,000	230,000
Malaya, Malacca	800,000	780,000	600,000
Borneo	50,000	40,000	30,000
Dutch East Indies, Java, Sumatra, etc..	700,000	650,000	500,000
India and Burma.....	55,000	50,000	40,000
Former German colonies, Samoa, East and West Africa.....	8,000	10,000	12,000
Totals	1,913,000	1,820,000	1,412,000

DISTRIBUTION.

The consumption of crude rubber of the various grades, exclusive of large quantities of reclaimed rubber, has been estimated as follows:

	1918.	1917.	1916.
England ..... *tons*	24,000	26,000	25,000
Germany, Austria, etc.....	1,000	1,000	1,500
France	14,000	10,000	8,500
Russia	2,000	7,000	20,000
Italy, Spain, Scandinavia, etc.....	5,000	5,500	4,000
Japan and Australia.....	5,000	5,000	5,000
America and Canada.....	187,000	155,000	114,000
Totals	238,000	210,000[2]	178,000[2]

[2]Underestimated.

Abnormal war-time influences have in many instances upset former distribution tendencies. Conservation of ship tonnage for war purposes reduced rubber consumption in England considerably and in Italy a little, while the rationing of neutrals by the Allies to prevent assistance to the enemy curtailed imports by Spain and the Scandinavian countries somewhat. The Central Powers found no way to increase their supply, and the Japanese and Australian demand has remained very nearly stationary. Continued chaotic conditions in Russia have reduced the consumption of rubber to one-tenth what it was in 1916. The big increases of the year have been in France and the United States; in the former almost entirely for war material, but in the latter partly because of wider use of rubber goods, especially pneumatic tires, by the entire population.

NOTE.—Much of the information contained in the above review was supplied by S. Figgis & Co., London.

RUBBER EXPORTS FROM THE STRAITS SETTLEMENTS AND FEDERATED MALAY STATES.

Statistics of the exports of rubber from the Federated Malay States and the Straits Settlements are now available to the general public. The official figures given below show that there was a falling off in the exports for the past year when compared with 1917, due, of course, to the lack of transport and the restrictions imposed upon imports by the United States government. Many of the rubber companies in Malaya adopted a policy of voluntary restriction of tapping; but there was at the end of the year a considerable amount of rubber stored at Singapore which will come into the present year's statistics when freer shipping facilities permit of its movement.

Appended are the exports for three years from the Federated Malay States:

	1916.	1917.	1918.
January ..... *tons*	4,471	5,995	7,588
February	5,207	7,250	6,820
March	4,429	7,088	7,709
April	3,914	5,955	7,428
May	3,956	7,179	5,881
June	5,114	6,009	5,161
July	5,053	5,798	5,706
August	5,782	6,487	5,291
Septembeer	6,376	7,087	6,588
October	5,968	7,079	5,901
November	6,776	6,180	7,097
December	5,718	7,724	7,085
Totals.....	62,764	79,831	78,225

The corresponding statistics for the Straits Settlements are given below; the transhipments for 1917 and 1918, amounting to 7,416 tons and 4,447 tons respectively, are included in the totals:

	1916.	1917.	1918.
January ..... *tons*	4,443	3,562	4,302
February	3,359	6,495	2,334
March	4,481	8,299	8,858
April	4,219	6,103	6,584
May	3,274	6,282	13,587
June	3,836	8,775	6,515
July	5,106	7,351	7,978
August	3,246	3,786	1,249
September	2,987	5,679	6,209
October	5,233	4,702	3,260
November	5,247	5,555	2,661
December	3,219	6,503	4,839
Totals.....	48,650	73,092	62,376

PLANTATION RUBBER EXPORTS FROM JAVA.

	October.		Ten Months Ended October 31.	
	1917.	1918.	1917.	1918.
To Holland ..... *kilos*	.....	.....	2,192,000	1,659,000
England.....	101,000	.....	12,371,000	4,781,000
United States.....	1,170,000	127,000	1,318,000	6,718,000
Singapore.....	226,000	233,000	25,000	1,710,000
Other countries.....	5,000	296,000		
Totals	1,502,000	656,000	15,906,000	14,868,000
From Batavia.....	940,000	332,000	9,284,000	7,839,000
Samarang.....	4,000	5,000	192,000	130,000
Soerabaya.....	557,000	319,000	6,191,000	6,668,000
Other ports.....	1,000	.....	239,000	231,000
Totals	1,502,000	656,000	15,906,000	14,868,000

Review of the Crude Rubber Market.

NEW YORK.

EARLY in February when large orders were placed by manufacturers, it seemed that the long-anticipated buying movement had actually commenced. The demand for plantation rubber, to arrive, was active, and spot stocks were quickly absorbed. As prices advanced, the activity subsided, however, indicating that manufacturers' requirements had been supplied, at least for the time being.

The reaction that followed resulted in lower prices that attracted a comparatively small volume of factory orders, and a limited amount of dealers' business was done. Quiet and easy conditions prevailed until later in the month when an active dealers' demand for near-by plantation rubber to cover short sales, gave strength to the market and prices advanced.

Generally speaking, the market for the month has been a favorable one for buyers whose requirements were not large, but with increasing arrivals of the crude material, conditions will undoubtedly continue to favor the manufacturers.

PLANTATIONS.—February 4, spot latex crêpe was 58 cents; March arrival 56 cents and May-June arrival 52 cents. February 20 spot latex was 56 cents; March arrival 56 cents and May-June arrival 52 cents.

Spot ribs were 57½ cents on February 4; March arrival 55 cents and May-June arrivals, 50 cents. On February 20, spot ribs were 55 cents; March arrival 53½ cents; May arrival 51½ cents and June-December, 50½ cents.

February 4, No. 1 amber crêpe was quoted March-April (East) 47½ cents. On February 20 the price of this grade was unchanged.

No. 1 roll brown crêpe, spot, sold for 39½ cents, on February 4, and declined to 37½ cents on February 20.

PARÁS.—February 4, upriver fine, spot, was 58 cents; islands fine, March-April, 48 cents; upriver coarse, spot, 34½ cents; upper caucho ball, spot, 34 cents; cametá, coarse, April-May, 22½ cents.

February 20, upriver fine, spot, was 58½ cents and cametá, coarse, April-May, 22½ cents.

NEW YORK QUOTATIONS.

Following are the New York spot quotations, one year ago, one month ago and on February 24, the current date:

	Mar. 1, 1918.	Feb. 1, 1919.	Feb. 24, 1919.
PLANTATION HEVEA—			
First latex crêpe / *Hevea first crêpe	55½@	56 @	56½@
Amber crêpe No. 1	48 @	53 @	50 @
Amber crêpe No. 2	46 @	52 @	49 @
Amber crêpe No. 3	43 @	51 @	48 @
Amber crêpe No. 4	42 @	50 @	46 @
Brown crêpe, thick clean	45 @	50 @	47 @
Brown crêpe, thin clean	45½@	50 @	47 @
Brown crêpe, thin specky	43 @	44 @	45 @
Brown crêpe, rolled	31 @	37 @	37 @ 38
Smoked sheet, ribbed standard quality / *Hevea ribbed smoked sheets	57 @	54 @	55½@
Smoked sheet, plain standard quality / *Hevea plain or smooth smoked sheets	55 @	53 @	54 @
Unsmoked sheet, standard quality / *Hevea unsmoked sheets	53 @	52 @	54 @
Colombo scrap No. 1	38 @	40 @	39 @
Colombo scrap, No. 2	35 @	38 @	37 @
BRAZILIAN PARAS—			
Upriver fine	57 @	58½@	58¼@
Upriver medium	51 @	53 @	53 @
Upriver coarse	36 @	34 @	34 @
Upriver weak fine	45 @	45 @	45 @
Upper caucho ball	35 @	33 @	34½@
BRAZILIAN PARAS—			
Islands fine	47 @	49 @	49 @
Islands medium	**37 @	43 @	44 @
Islands coarse	24 @	23 @	21½@
Cametá, coarse	24½@	23 @	22 @
Lower caucho ball	32 @	@	32 @
Peruvian fine	53 @	**56 @	**56 @
Tapajos fine	53 @	**56 @	55 @
AFRICANS—			
Niger flake, prime	48 @	**25 @	24 @
paste	47 @	**24 @	**24 @
Benguela, extra No. 1, 28%	**29 @	32 @	**32 @
Benguela, No. 2, 32½%	**28 @	30 @	**30 @
Congo prime, black upper	48 @	46 @	45 @
Congo prime, red upper	45 @	**46 @	**46 @
Rio Nunez ball	@	**55 @	**55 @
Rio Nunez sheets and strings	**63 @	**55 @	**55 @
Conakry niggers	@	**55 @	**55 @
Massai sheets and strings	**63 @	**55 @	**55 @
CENTRALS—			
Corinto scrap	35 @	37 @ 39	36 @ 37
Esmeralda sausage	35 @	37 @ 39	36 @
Central scrap	33 @	37 @	36½@
Central scrap and strip, 75 per cent.	32 @	33 @	33 @
Central wet sheet, 25%	26 @	24 @	24 @ 25
Guayule, 20% guarantee	@	35 @	33 @ 34
Guayule, dry	@	46 @	46 @
MANICOBAS—			
Ceara negro heads	**33 @	@	**35 @
Ceara scrap	**29 @	@	**35 @
Manicoba (basis 30% loss washing and drying)	37 @	40 @	40 @ 41
Mangabeira thin sheet	35 @	38 @	37 @ 38
EAST INDIAN—			
Assam crêpe	**37 @	**36 @	**36 @
Assam onions	**36 @	**44 @	**44 @
Penang block scrap	**34 @	37 @	38 @
BALATA—			
Block, Ciudad Bolivar	72½@	75 @	71 @ 72
Colombia	57 @	63 @	60 @ 61
Panama	54 @	55 @	56 @
Surinam sheet	88 @	90 @	88 @ 89
amber	97 @	92 @	90 @
PONTIANAK—			
Banjermassin	13 @	14 @	13½@
Palembang	@	16 @	**16 @
Pressed block	21 @	21 @	19 @
Sarawak	@	12 @	**12 @
GUTTA PERCHA—			
Gutta Siak	25 @	25 @	20 @
Red Macassar	2.20 @	3.00 @	2.50 @3.00

*Rubber Association of America nomenclature.
**Nominal.

RECLAIMED RUBBER.

The conditions that prevailed in the reclaimed rubber market during February were noticeably better than last month owing to more frequent inquiries from the manufacturers. While the activities recorded in the market for crude rubber have not affected reclaims to any great extent, there is reason to believe that the anticipated demand for reclaimed rubber should materialize before many weeks Prices have remained the same with the exception of shoe and tire stocks that are from one-quarter to one-half cent lower than last month.

NEW YORK QUOTATIONS.

FEBRUARY 24, 1919.

Subject to change without notice.

Standard reclaims:		
Floating	lb.	.35 @ .40
Friction	lb.	.35 @ .40
Mechanical	lb.	.12 @ .13
Red	lb.	.20 @ .25
Shoe	lb.	.14¼@ .15¼
Tire, auto	lb.	.17¼@ .17¾
truck	lb.	.12¾@ .13¼
White	lb.	.24 @ .25

COMPARATIVE HIGH AND LOW SPOT RUBBER PRICES.

PLANTATIONS:	February. 1919.[1]	1918.	1917.
First latex crêpe	$0.58 @0.56	$0.53½ @0.51½	
Smoked sheet ribbed	.57½ @ .54	.52 @ .49½	
PARÁS:			
Upriver fine	.59½ @ .58½	.58½ @ .56	$0.87 @0.75
Upriver coarse	.35 @ .34	.37½ @ .35	.57 @ .50
Islands, fine	.49½ @ .49	.48 @ .47	.80 @ .67
Islands, coarse	.22¾ @ .22½	.35 @ .24	.36 @ .31
Cametá	.23 @	.35 @ .24	.40 @ .34

[1] Figured only to February 24.

WEEKLY RUBBER REPORT.

GUTHRIE & CO., LIMITED, Singapore, report [January 6, 1919]:

Following advices of declining prices in the London and American markets, the rubber auction opened on January 2, with a rather weak tone, and although values show a slight improvement, they are generally below the level of business done prior to the auction. On the first day of the sale ribbed smoked sheet sold up to 76 cents and fine pale crêpe, for which there was less demand than usual, reached 77½ cents, an advance of 2½ cents on sheet and ½ cent on crêpe. These prices were barely maintained as the sale proceeded and the auction closed at 76½ cents for sheet and 77 cents for crêpe. Brown and good dark crêpes were in good demand at prices 2 to 4 cents up. Small quantities of plain smoked and unsmoked sheet were sold.

The sale occupied the greater part of three days and 922 tons changed hands out of 1,883 tons cataloged.

The following was the course of values:

	In Singapore per Pound.[1]			Sterling Equivalent per Pounds in London.		
Sheet, fine ribbed smoked	74c	@	78c	2/ 1⅞	@	2/ 3¼
Sheet, good ribbed smoked	63½	@	73½	1/11	@	2/ 1¾
Sheet, plain smoked	60	@	71	1/10	@	2/ 1
Sheet, ribbed unsmoked	59½	@	60½	1/ 9¾	@	1/10½
Sheet, plain unsmoked	50	@	56	1/ 7½	@	1/ 8⅞
Crêpe, fine pale	74	@	77½	2/ 1⅞	@	2/ 2¾
Crêpe, good pale	66	@	74	1/11⅛	@	2/ 1⅞
Crêpe, fine brown	58½	@	68	1/ 9½	@	2/ 0¼
Crêpe, good brown	43	@	57½	1/ 5⅛	@	1/ 9¼
Crêpe, dark	34	@	46	1/ 2¾	@	1/ 6
Crêpe, bark	26½	@	38½	1/ 0½	@	1/ 3⅝
Scrap, virgin and pressed	22	@	27	/11¼	@	1/ 0¾
Scrap, loose	20½	@	29	/10¾	@	1/ 1¼

[1] Quoted in S. S. Currency.

THE MARKET FOR COMMERCIAL PAPER.

In regard to the financial situation, Albert B. Beers, broker in crude rubber and commercial paper, No. 68 William street, New York, advises as follows:

During February the demand for commercial paper has been rather erratic and mostly from out-of-town banks, the best rubber names going at 5½ to 5¾ per cent, and those not so well known 6 to 6½ per cent.

CRUDE RUBBER ARRIVALS AT THE PORT OF NEW YORK.

The following statistics are not complete, due to government orders prohibiting access to the records.

[*The Figures Indicate Weight in Pounds.*]

PARAS.

	Fine.	Medium.	Coarse.	Caucho.	Cametá.	Totals.
JANUARY 27. By the *Florence Phillips*, from Pará.						
H. A. Astlett & Co.	109,800	33,500	49,000	325,000	36,000	553,500
FEBRUARY 1. By the *Tapajos*, from Manáos.						
Aldens' Successors, Limited	127,802	33,737	.....	6,378	.....	167,917
FEBRUARY 1. By the *Pocone*, from Manáos.						
Aldens' Successors, Limited	.....	.....	.....	19,627	.....	19,627
FEBRUARY 1. By the *Harry Deering*, from Pará.						
H. A. Astlett & Co.	32,500	.....	69,000	27,000	.....	128,500
FEBRUARY 1. By the *Tapijos*, from Pará.						
General Rubber Co.	.....	.....	22,400	22,400	.....	44,800
H. A. Astlett & Co.	164,000	51,000	101,000	50,000	.....	366,000
Meyer & Brown	233,000[1]	.....	.....	67,200	.....	300,200
Poel & Kelly	116,879	14,024	101,855	26,263	7,275	266,296
FEBRUARY 1. By the *Pocone*, from Pará.						
General Rubber Co.	44,800	.....	.....	.....	.....	44,800
H. A. Astlett & Co.	165,000	49,000	7,000	24,000	26,000	271,000
Poel & Kelly	222,074	37,123	60,467	10,659	.....	330,323
Meyer & Brown	.....	.....	44,800	22,400	.....	67,200
FEBRUARY 18. By the *Uberaba*, from Pará.						
General Rubber Co.	80,640	.....	.....	.....	.....	80,640
Meyer & Brown	76,200[1]	.....	.....	.....	.....	76,200
H. A. Astlett & Co.	160,000	45,000	7,000	.....	38,000	250,000

[1] Includes medium also.

ARRIVALS AT THE PORT OF NEW YORK.

PLANTATIONS.

Pounds.

JANUARY 24. By the *Nagano Maru*, from Colombo:
Poel & Kelly 152,000
L. Littlejohn & Co., Inc. 409,920 561,920

JANUARY 28. By the *Krasnoiarsk*, from Colombo:
Poel & Kelly 100,000

FEBRUARY 1. By the *Trafford Hall*, from Colombo:
Poel & Kelly 172,000
Fred Stern & Co. 22,400
L. Littlejohn & Co., Inc. 224,000 418,400

FEBRUARY 10. By the *Kathlamba*, from Colombo:
General Rubber Co. 216,680
Poel & Kelly 302,000
L. Littlejohn & Co., Inc. 1,220,680 1,739,360

AFRICANS.

FEBRUARY 10. By the *Carmania*, from Liverpool:
Poel & Kelly 30,800

GUAYULE.

FEBRUARY 7. By rail, from Eagle Pass, Texas:
Continental-Mexican Rubber Co. 51,000

CRUDE RUBBER ARRIVALS AT PACIFIC COAST AS REPORTED.

PLANTATIONS.

AT SAN FRANCISCO.

JANUARY 21. By the *Colusa*, from Singapore:
General Rubber Co. 203,840

FEBRUARY 5. By the *Socrakarta*, from Batavia:
General Rubber Co. 122,000

AT SEATTLE.

Pounds.

JANUARY 23. By the *Shinpo Maru*, from Singapore:
Meyer & Brown 257,600
Poel & Kelly 290,000
Fred Stern & Co. 44,800
Rubber Trading Co. 89,600 682,000

JANUARY 31. By the *Taiyo Maru*, from Singapore:
Meyer & Brown 168,000
Poel & Kelly 65,000
Mitsui & Co. 336,000 569,000

Pounds.

FEBRUARY 10. By the *Arabia Maru*, from Singapore:
General Rubber Co. 156,800
Meyer & Brown 112,000
[1]Fred Stern & Co. 404,200 673,000

FEBRUARY 11. By the *Senator*, from Singapore:
General Rubber Co. 1,429,120
Meyer & Brown 940,800 2,369,920

FEBRUARY 12. By the *Koan Maru*, from Singapore:
General Rubber Co. 1,120,000
Meyer & Brown 212,800
Poel & Kelly 385,280
Fred Stern & Co. 224,000
Rubber Trading Co. 152,320 2,094,400

[2]FEBRUARY 12. By the *Himalaya Maru*, from Singapore:
Meyer & Brown 134,400
Fred Stern & Co. 197,020
Rubber Trading Co. 94,080
The United Malaysian Rubber Co., Limited 22,400 447,900

FEBRUARY 18. By the *Easterling*, from Singapore:
J. T. Johnstone & Co. 165,340

FEBRUARY 18. By the *Shinkoku* Maru, from Straits Settlements:
[1]J. T. Johnstone & Co. 61,500

AT VANCOUVER.

JANUARY 25. By the *Kamo Maru*, from Colombo:
Meyer & Brown 280,000

JANUARY 25. By the *Hiyahu*, from Singapore:
Meyer & Brown 89,600

FEBRUARY 6. By the *Kashima Maru*, from Singapore:
General Rubber Co. 624,960

FEBRUARY 17. By the *Key West*, from Singapore:
General Rubber Co. 2,197,440
Meyer & Brown 520,000
Fred Stern & Co. 151,200
Rubber Trading Co. 8,960 2,677,600

PONTIANAK.

FEBRUARY 12. By the *Himalaya Maru*, from Singapore:
[1]The United Malaysian Rubber Co., Limited 112,000

Pounds.

FEBRUARY 17. By the *Key West*, from Singapore:
[2]The United Malaysian Rubber Co., Limited 224,160

GUTTA PERCHA.

FEBRUARY 11. By the *Senator*, from Singapore:
[2]The United Malaysian Rubber Co., Limited 168,000

FEBRUARY 12. By the *Himalaya Maru*, from Singapore:
[1]The United Malaysian Rubber Co., Limited 168,000

FEBRUARY 17. By the *Key West*, from Singapore:
[2]The United Malaysian Rubber Co., Limited 56,000

[1] Arrived at Tacoma.
[2] Arrived at Vancouver.
[3] Arrived at Seattle.

CRUDE RUBBER ARRIVALS AT PACIFIC COAST AS STATED BY SHIP'S MANIFESTS.[1]

SEATTLE AND TACOMA.

PLANTATIONS.

[*Figured 180 pounds net to the case or bale.*]

TO AKRON, OHIO.

Pounds.

JANUARY 24. By the *Shinpo Maru*, from Kobe, via Seattle:
The Goodyear Tire & Rubber Co. 431,640

JANUARY 30. By the *Taiyo Maru*, from Singapore, via Hongkong:
Swinehart Tire & Rubber Co. 56,700

FEBRUARY 12. By the *Koan Maru*, from Singapore, via Seattle:
The B. F. Goodrich Co. 402,660

TO BOSTON, MASS.

FEBRUARY 12. By the *Koan Maru*, from Singapore:
Boston Insulated Wire & Cable Co. 3,780

[1] Footnote—The figures under this head and under Crude Rubber Arrivals at Pacific Coast as Reported, have been obtained from different sources; repetitions may, therefore, occur.

POUNDS.

TO NEW YORK.

JANUARY 24. By the *Shinpo Maru*, from Kobe, via Seattle:

Aldens' Successors, Limited	4,140	
Meyer & Brown	284,040	
Edward Maurer Co., Inc.	55,800	
Fred Stern & Co.	10,800	
Poel & Kelly	284,220	
Robinson & Co.	99,360	
William H. Stiles & Co.	129,780	
W. R. Grace & Co.	10,800	
L. Littlejohn & Co.	107,100	
Rubber Trading Co.	83,340	1,069,380

JANUARY 24. By the *Shinpo Maru*, from Port Swettenham, via Kobe:

Aldens' Successors, Limited	134,820	
Robinson & Co.	9,000	143,820

JANUARY 30. By the *Taiyo Maru*, from Penang, via Singapore:

F. R. Henderson & Co.		18,360

JANUARY 30. By the *Taiyo Maru*, from Port Swettenham, via Hongkong:

Meyer & Brown	130,140	
F. R. Henderson & Co.	320,400	
Aldens' Successors, Limited	39,060	
Edward Maurer Co., Inc.	205,200	
Poel & Kelly	27,900	
Charles T. Wilson Co., Inc.	92,520	
Robinson & Co.	89,640	
Hadden & Co.	106,380	1,011,240

JANUARY 30. By the *Taiyo Maru*, from Singapore, via Hongkong:

Rubber Importers & Dealers Co., Inc.	$61,000	
Poel & Kelly	31,860	
Hadden & Co.	81,360	674,220

[2] FEBRUARY 12. By the *Himalaya Maru*, from Penang, via Yokohama:

William H. Stiles		11,520

[2] FEBRUARY 12. By the *Himalaya Maru*, from Port Swettenham, via Yokohama:

Aldens' Successors, Limited		37,260

[2] FEBRUARY 12. By the *Himalaya Maru*, from Teluk Anson, via Yokohama:

Aldens' Successors' Limited		7,200

[2] FEBRUARY 12. By the *Himalaya Maru*, from Singapore, via Yokohama:

Charles T. Wilson Co., Inc.	199,620	
Aldens' Successors, Limited	46,440	
Meyer & Brown	128,340	
Rubber Trading Co.	86,380	
L. Littlejohn & Co.	36,180	
William H. Stiles	20,200	
Robinson & Co.	4,800	521,960

FEBRUARY 12. By the *Koan Maru*, from Singapore:

Charles T. Wilson Co., Inc.	475,560	
Meyer & Brown	186,300	
Edward Maurer & Co.	316,800	
Rubber Trading Co.	136,620	
General Rubber Co.	876,600	
Poel & Kelly	258,300	
Robinson & Co.	122,400	
William H. Stiles	20,160	
Beck Van Siclen Co.	78,120	
Hadden & Co.	221,220	
Avery McPhillips	159,300	
Rubber Importing & Dealers Co., Inc.	77,760	2,929,140

TO SAN FRANCISCO, CALIF.

JANUARY 24. By the *Shinpo Maru*, from Penang, via Kobe:

Robinson & Co.		3,960

TO SEATTLE, WASH.

JANUARY 24. By the *Shinpo Maru*, from Kobe:

Aldens' Successors, Limited	155,340	
L. Littlejohn & Co.	500,400	
Mitsui & Co., Limited	83,340	
Poel & Kelly	1,080	740,160

JANUARY 24. By the *Shinpo Maru*, from Penang, via Kobe:

Aldens' Successors, Limited	91,620	
Fred Stern & Co.	27,000	118,620

JANUARY 30. By the *Taiyo Maru*, from Penang, via Hongkong:

Aldens' Successors, Limited	9,000	
F. R. Henderson & Co.	8,100	17,100

JANUARY 30. By the *Taiyo Maru*, from Singapore, via Hongkong:

L. Littlejohn & Co.	302,940	
F. R. Henderson & Co.	57,220	
Mitsui & Co., Limited	165,060	525,220

FEBRUARY 1. By the *Kashima Maru*, from Singapore, via Yokohama:

Edward Maurer Co., Inc.		46,620

FEBRUARY 8. By the *Arabia Maru*, from Singapore, via Yokohama:

F. R. Henderson & Co.	297,900	
Mitsui & Co.	72,000	
Robinson & Co.	3,600	
Fred Stern & Co.	288,360	
Rubber Importers & Dealers Co., Inc.	78,300	740,160

POUNDS.

FEBRUARY 11. By the *Senator*, from Singapore, via Hongkong:

General Rubber Co.	1,115,460	
Meyer & Brown	862,800	
Firestone Tire & Rubber Co.	500,580	
L. Littlejohn & Co.	104,760	2,583,600

[2] FEBRUARY 12. By the *Himalaya Maru*, from Penang, via Yokohama:

Aldens' Successors, Limited.	36,540	
Rubber Trading Co.	5,580	42,120

[2] FEBRUARY 12. By the *Himalaya Maru*, from Singapore, via Yokohama:

Mitsui & Co., Limited	202,860	
L. Littlejohn & Co.	121,140	
Fred Stern & Co.	171,720	
Malaysian Rubber Co.	20,160	515,880

FEBRUARY 12. By the *Koan Maru*, from Singapore:

L. Littlejohn & Co.	339,480	
Edward Maurer Co., Inc.	96,300	
Fred Stern & Co.	223,020	
Far East Importing Co.	123,300	
Robinson & Co.	1,800	
Aldens' Successors, Limited.	3,600	
J. T. Johnstone & Co.	27,540	
Poel & Kelly	124,920	
Raus Products Co.	61,200	
Rockhill & Victor	90,000	1,091,160

TO TACOMA.

FEBRUARY 8. By the *Arabia Maru*, from Singapore, via Yokohoma:

United States Rubber Co.	134,460	
Canadian Consolidated Rubber Co., Limited	111,960	
L. Littlejohn & Co.	761,400	
William H. Stiles	132,120	
Meyer & Brown	118,800	
F. R. Henderson & Co.	74,880	
Rubber Importers & Dealers Co., Inc.	193,140	
Robinson & Co.	61,020	1,587,780

TO WATERTOWN, MASS.

FEBRUARY 12. By the *Koan Maru*, from Singapore:

Hood Rubber Co.		503,640

TO TORONTO, ONT.

JANUARY 24. By the *Shinpo Maru*, from Kobe, via Vancouver:

Dunlop Tire & Rubber Goods Co., Limited		12,960

[2] Discharged cargo at Tacoma.

SAN FRANCISCO.

FEBRUARY 5. By the *Soerakarta*, from Batavia:

General Rubber Co.	201,420	
Edward Maurer & Co.	301,680	
The Goodyear Tire & Rubber Co.	1,260,900	
A. C. Fox & Co.	50,760	
Robinson & Co.	11,520	1,826,280

VANCOUVER.

TO AKRON, OHIO.

JANUARY 22. By the *Monteagle*, from Singapore, via Hongkong:

The B. F. Goodrich Co.		863,100

JANUARY 25. By the *Kamo Maru*, from Colombo, via Kobe:

J. T. Johnstone & Co.	44,820	
The Goodyear Tire & Rubber Co.	719,100	763,920

FEBRUARY 6. By the *Kashima Maru*, from Singapore, via Hongkong:

The B. F. Goodrich Co.		69,120

FEBRUARY 6. By the *Kashima Maru*, from Colombo, via Hongkonk:

The Goodyear Tire & Rubber Co.		298,800

FEBRUARY 15. By the *Key West*, from Singapore:

The B. F. Goodrich Co.	1,440,700	
Firestone Tire & Rubber Co.	84,060	
The Goodyear Tire & Rubber Co.	2,491,200	4,015,960

TO DETROIT, MICH.

FEBRUARY 6. By the *Kashima Maru*, from Singapore, via Hongkong:

Morgan & Wright		617,220

TO NEW YORK.

JANUARY 22. By the *Monteagle*, from Penang, via Hongkoong:

Aldens' Successors, Limited.	69,120	
Robinson & Co.	94,640	163,760

JANUARY 25. By the *Kamo Maru*, from Colombo, via Kobe:

Meyer & Brown		338,940

FEBRUARY 6. By the *Kashima Maru*, from Singapore, via Hongkong:

Hadden & Co.		117,860

FEBRUARY 15. By the *Key West*, from Penang, via Singapore:

Aldens' Successors, Limited.	12,240	
Fred Stern & Co.	71,460	
Rubber Trading Co.	7,200	
W. R. Grace & Co.	11,880	102,780

POUNDS.

FEBRUARY 15. By the *Key West*, from Singapore:

United States Rubber Co.	1,927,800[5]	
Charles T. Wilson Co., Inc.	172,620	
Robinson & Co.	99,360	
William H. Stiles	45,720	
Edward Maurer	204,840	
Curry, McPhillips & Co.	144,080	
L. Littlepjohn & Co.	428,400	
F. R. Henderson & Co.	106,380	
Poel & Kelly	439,200[5]	3,568,400

[5]55,440 pounds shortshipped.
[5]50,400 pounds shortshipped.

TO SEATTLE.

JANUARY 22. By the *Monteagle*, from Penang, via Hongkong:

Robinson & Co.		1,980

FEBRUARY 15. By the *Key West*, from Penang, via Singapore:

Robinson & Co.	11,520	
L. Littlepohin & Co.	47,160	
Fred Stern & Co.	65,520	124,200

FEBRUARY 15. By the *Key West*, from Singapore:

Aldens' Successors, Limited.	18,000	
J. T. Johnstone & Co.	103,680	
Fred Stern & Co.	5,040	
Poel & Kelly	61,200	
L. Littlejohn & Co.	458,640	
W. R. Grace & Co.	4,320	
Hadden & Co.	89,460	
Peninsular Trading Co.	44,640	784,980

TO WATERTOWN, MASS.

FEBRUARY 15. By the *Key West*, from Singapore:

Hood Rubber Co.		175,680

GUTTA SIAK.

TO NEW YORK.

FEBRUARY 8. By the *Arabia Maru*, from Singapore, via Yokohama and Tacoma:

United Malaysian Rubber Co., Limited		300

FEBRUARY 12. By the *Himalaya* Maru, from Singapore, via Yokohoma:

United Malaysian Rubber Co., Limited		118,800

TO SEATTLE.

FEBRUARY 11. By the *Senator*, from Singapore, via Hongkong:

United Malaysian Rubber Co.		179,100

FEBRUAR 12. By the *Koan Maru*, from Singapore:

L. Littlejohn & Co.		162,900

JELUTONG.

TO NEW YORK.

FEBRUAR 8. By the *Arabia Maru*, from Singapore, via Yokohama and Tacoma:

Various		165,000

FEBRUARY 12. By the *Himalaya Maru*, from Singapore, via Yokohama:

United Malaysian Rubber Co., Limited		150,000[3]

[3]Untreated.

TO SEATTLE.

JANUARY 30. By the *Taiyo Maru*, from Singapore, via Hongkong:

L. Littlejohn & Co.		90,000

FEBRUARY 11. By the *Senator*, from Singapore, via Hongkong:

Bowring & Co.		300[4]

FEBRUARY 12. By the *Koan Maru*, from Singapore:

L. Littlejohn & Co.		226,500

GUTTA PERCHA.

TO SEATTLE.

JANUARY 30. By the *Taiyo Maru*, from Singapore, via Hongkong:

L. Littlejohn & Co.		11,100

[4]Treated.

RUBBER IMPORTS AND EXPORTS AT BOSTON.

PORT OF THE DISTRICT OF MASSACHUSETTS.—DECEMBER, 1918.

IMPORTS.

UNMANUFACTURED—*free*:	POUNDS.	VALUE.
Crude rubber:		
From Straits Settlements	561,401	$149,531
MANUFACTURED—		
Rubber goods:		
From England		1,169

EXPORTS OF DOMESTIC MERCHANDISE.

MANUFACTURED—		
Rubber boots—*pairs*	1,140	2,971
Rubber shoes—*pairs*	3,577	3,379
Druggists' rubber sundries		480
Other manufactures		3,077
Total		$9,707

RUBBER IMPORTS AND EXPORTS AT NEW YORK.

IMPORTS.

UNMANUFACTURED—*free:*	December, 1918. Pounds.	Value.
Crude rubber:		
From Canada	12,400	$3,536
Costa Rica	2,350	1,233
Nicaragua	11,483	3,272
Panama	150	48
Mexico	110,000	35,300
Bolivia	474,781	207,793
Brazil	5,582,432	1,776,418
Colombia	32,398	14,482
Ecuador	1,400	209
Peru	152,000	49,390
Straits Settlements	743,633	289,867
Other British East Indies	118,287	51,572
Dutch East Indies	485,504	151,839
Philippine Islands	29,860	13,463
British West Africa	21,211	5,091
Totals	7,777,889	$2,603,513
Balata:		
From Panama	9,310	$3,748
Colombia	12,740	6,128
British Guiana	23,751	21,415
Dutch Guiana	13,406	9,802
Totals	59,216	$41,093
Scrap rubber	684,299	$63,706

EXPORTS OF DOMESTIC MERCHANDISE.

MANUFACTURED—	December, 1918. Pounds.	Value.
Automobile Tires:		
To Belgium	.....	$28,718
France	.....	172,454
Spain	.....	20,723
Sweden	.....	18,825
Costa Rica	.....	2,318
Honduras	.....	1,758
Nicaragua	.....	468
Panama	.....	6,037
Salvador	.....	4,361
Mexico	.....	24,621
Barbados	.....	4,103
Jamaica	.....	28,022
Trinidad	.....	8,042
Other British West Indies	.....	6,778
Cuba	.....	72,258
Danish West Indies	.....	821
Dutch West Indies	.....	774
French West Indies	.....	20,700
Haiti	.....	3,231
Santo Domingo	.....	17,556
Argentina	.....	351
Bolivia	.....	5,252
Brazil	.....	8,834
Chile	.....	133,717
Colombia	.....	860
Ecuador	.....	3,930
British Guiana	.....	4,624
Peru	.....	58,939
Venezuela	.....	16,719
British India	.....	1,515
Straits Settlements	.....	1,399
Dutch East Indies	.....	9,493
Hong Kong	.....	1,488
Australia	.....	1,238
British West Africa	.....	14,308
British South Africa	.....	269
French Africa	.....	131
Total	.....	$705,635
All other tires	.....	$31,143
Belting	.....	237,224
Rubber boots ....*pairs*	19,127	93,658
Rubber shoes ....*pairs*	19,641	14,859
Druggists' sundries	.....	22,499
Other rubber manufactures	.....	372,225
Total	.....	$771,608
Reclaimed rubber....*pounds*	71,239	10,753

EXPORTS OF FOREIGN MERCHANDISE.

UNMANUFACTURED—		
Balata:		
To England	60,480	$36,180
Gutta percha:		
To England	180	72

OFFICIAL INDIA RUBBER STATISTICS FOR THE UNITED STATES.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

	November. 1917. Pounds.	Value.	1918. Pounds.	Value.
UNMANUFACTURED—*free:*				
India rubber:				
From France	2,307	$2,014	.....	.....
Portugal	34,833	20,900	.....	.....
United Kingdom	1,185,348	599,796	.....	.....
Canada	87,610	57,916	1,200	$675
Central America	64,301	24,780	2,100	630
Mexico	71,979	24,930	444,545	160,301
Brazil	1,680,088	590,726	2,224,882	800,366
Peru	174,393	81,810	.....	.....
Other South America	218,835	95,794	52,013	21,806
British East Indies	28,316,106	15,353,056	10,891,900	3,906,526
Dutch East Indies	3,190,475	1,681,688	396,968	146,026
Other countries	86,498	42,115	1,157,571	535,161
Totals	35,112,773	$18,575,525	15,171,179	$5,571,491
Balata	150,148	63,242	47,678	18,391
Guayule	805,612	238,304	.....	.....
Jelutong (Pontianak)	690,784	45,331	62,669	9,616
Gutta percha	22,560	3,086	.....	.....
Totals	1,669,104	$349,963	110,347	$28,007
Rubber scrap	1,865,262	126,708	543,021	33,643
	38,647,139	$19,052,196	15,824,547	$5,633,141
Chicle .....*dutiable*	460,078	281,264	536,412	293,944
MANUFACTURED—*dutiable:*				
India rubber and gutta percha	.....	52,696	.....	20,395
India rubber substitutes	.....	1,360	11,200	4,623

EXPORTS OF DOMESTIC MERCHANDISE.

MANUFACTURED—				
Automobile tires[1]	.....	$1,006,205	.....	$1,268,845
All other tires[1]	.....	174,085	.....	57,868
Scrap and old	131,312	22,844	158,130	18,525
Reclaimed rubber	153,388	28,159	215,351	36,276
Belting, hose, and packing[1]	.....	695,519	.....	399,812
Rubber boots[1] .....*pairs*	270,116	821,592	72,481	277,096
Rubber shoes[1] .....*pairs*	176,825	95,515	121,418	97,102
Druggists' rubber sundries[1]	.....	120,082	.....	60,441
Insulated wire and cables	.....	713,533	.....	398,956
Other rubber manufactures[1]	.....	563,327	.....	477,817
Totals, manufactured	.....	$4,240,861	.....	$3,092,738
Fountain pens .....*number*	15,880	17,934	36,479	33,708

EXPORTS OF FOREIGN MERCHANDISE.

UNMANUFACTURED—				
India rubber	291,579	$148,560	119,750	$59,361
Gutta percha	32,590	8,148	.....	.....
Totals, unmanufactured	324,169	$156,708	119,750	$59,361
MANUFACTURED—				
India rubber	.....	$2,138	.....	$7,364
Gutta percha	.....	3,252	.....	.....
Totals, manufactured	.....	$5,390	.....	$7,364
Chicle	.....	.....	500	330

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORIES OF THE UNITED STATES.

	November. 1917. Value.	1918. Value.
MANUFACTURED—		
To Alaska:		
Belting, hose, and packing	.....	$2,501	.....	$4,437
Boots and shoes.....*pairs*	3,596	7,771	3,152	5,997
Other rubber goods	.....	5,836	.....	1,155
Totals	.....	$16,108	.....	$11,589
To Hawaii:				
Belting, hose, and packing	.....	$18,095	.....	$10,330
Automobile tires	.....	162,359	.....	120,464
Other tires	.....	6,219	.....	936
Other rubber goods	.....	27,344	.....	21,650
Totals	.....	$214,017	.....	$153,380
To Philippine Islands:				
Belting, hose, and packing	.....	$21,311	.....	$15,089
Boots and shoes.....*pairs*	4,548	4,154	28,912	23,111
Tires	.....	77,205	.....	31,295
Other rubber goods	.....	10,025	.....	24,878
Totals	.....	$112,695	.....	$94,373
To Porto Rico:				
Belting, hose, and packing	.....	$7,414	.....	$5,307
Automobile tires	.....	102,368	.....	55,571
Other tires	.....	865	.....	910
Other rubber goods	.....	10,388	.....	6,458
Totals	.....	$121,036	.....	$68,246

[1]Details of exports of domestic merchandise by countries during November, 1918, were given in THE INDIA RUBBER WORLD, February 1, 1919, page 278.

LONDON AND LIVERPOOL RUBBER STATISTICS.

The import and export figures by countries usually published in this table are withheld by the British Government.

IMPORTS.

	December. 1917. Pounds.	Value.	1918. Pounds.	Values.
UNMANUFACTURED—				
Crude rubber:				
At London	1,477,700	£177,735	7,390,300	£762,345
Liverpool	4,763,000	618,918	4,538,300	531,936
Totals	6,240,700	£796,653	11,928,600	£1,294,281
Waste and reclaimed rubber:				
At London	3,400	40	500	12
Liverpool	104,700	992	.....	.....
Totals	108,100	£1,032	500	£12

EXPORTS.

Waste and reclaimed rubber:				
From London	198,900	£3,088	284,000	£5,196
Liverpool	107,400	1,587	186,700	3,495
Totals	306,300	£4,675	470,700	£8,691

REEXPORTS.

Crude rubber:				
From London	2,596,800	£320,857	1,080,400	£127,091
Liverpool	691,000	89,917	785,500	95,638
Totals	3,287,800	£410,774	1,865,900	£222,729
Waste and reclaimed rubber:				
From Liverpool	22,500	£945	.....	.....

EXPORTS OF INDIA RUBBER MANUFACTURES AND INSULATED WIRE AND CABLE FROM THE UNITED STATES DURING THE MONTH OF DECEMBER, 1918. (BY COUNTRIES.)

EXPORTED TO—	Belting, Hose and Packing.	Boots.		Shoes.		Druggists' Rubber Sundries.	Tires. For Automobiles.	Tires. All Others.	Insulated Wire and Cables.	All Other Manufactures.	Total
EUROPE:	Value.	Pairs.	Value.	Pairs.	Value.	Value.	Value.	Value.	Value.	Value.	Value.
Belgium	.....	5,990	$32,705	.....	.....	.....	$28,718	.....	.....	.....	$61,423
Denmark	$1,539	.....	.....	.....	.....	$506	.....	.....	$761	$1,047	3,853
France	700	12,600	58,894	.....	.....	234	203,689	.....	11,017	117,982	392,516
Iceland and Faroe Islands	.....	.....	.....	.....	.....	20	.....	.....	54	27	101
Italy	.....	.....	.....	.....	.....	666	.....	.....	11,828	23,972	36,466
Norway	.....	.....	.....	.....	.....	.....	2,272	.....	540	.....	2,812
Portugal	.....	.....	.....	322	$425	.....	.....	$91	.....	610	1,126
Spain	970	.....	.....	3,656	1,812	3,177	20,723	.....	88,944	377	116,003
Sweden	.....	.....	.....	.....	.....	.....	18,825	.....	.....	.....	18,825
England	4,799	3	11	.....	.....	2,159	.....	15,200	16,165	78,543	116,868
TOTALS, EUROPE	$8,008	18,593	$91,610	3,978	$2,237	$6,753	$274,227	$15,291	$129,309	$222,558	$749,993
NORTH AMERICA:											
Bermuda	$85	.....	.....	.....	.....	$117	.....	.....	$234	$668	$1,104
British Honduras	25	.....	.....	1,257	$1,329	100	$498	$100	140	6	2,198
Canada	30,228	4,813	$15,392	17,822	17,462	29,169	63,325	5,038	8,636	138,108	307,298
Costa Rica	29	.....	.....	.....	.....	162	2,318	.....	222	832	3,563
Guatemala	214	.....	.....	145	166	41	428	393	.....	557	1,801
Honduras	1,992	.....	.....	126	164	326	1,758	362	114	46	4,762
Nicaragua	1,937	.....	.....	52	43	87	730	93	3	689	3,582
Panama	4,203	.....	.....	.....	.....	799	6,217	224	1,709	2,854	16,006
Salvador	491	.....	.....	.....	.....	17	5,411	.....	2,907	571	9,397
Mexico	42,903	2	14	743	769	4,979	63,254	6,733	13,346	11,990	143,988
Miquelon, Langley, etc	.....	60	254	411	240	.....	.....	.....	.....	198	692
Newfoundland and Labrador	4,449	1,740	5,049	6,147	5,473	603	1,446	.....	369	1,676	19,065
Barbados	376	.....	.....	1,082	1,285	163	4,103	564	52	580	7,123
Jamaica	785	.....	.....	24	53	327	28,022	542	740	1,164	31,633
Trinidad and Tobago	2,135	.....	.....	312	250	27	8,042	288	378	1,965	13,085
Other British West Indies	290	.....	.....	804	942	777	6,778	19	31	113	8,950
Cuba	28,764	48	118	7,419	4,846	2,917	98,393	1,856	30,236	47,449	214,579
Danish West Indies	47	.....	.....	192	139	42	821	24	.....	112	1,185
Dutch West Indies	.....	.....	.....	17	31	45	1,076	.....	.....	164	1,316
French West Indies	294	.....	.....	330	397	.....	20,700	204	20	290	21,905
Haiti	70	.....	.....	1	2	22	3,231	502	77	303	4,207
Dominican Republic	2,147	.....	.....	600	709	215	17,940	1,220	986	1,750	24,967
TOTALS, NORTH AMERICA	$121,464	6,663	$20,827	37,484	$34,300	$40,875	$344,491	$18,164	$60,200	$212,085	$852,406
SOUTH AMERICA:											
Argentina	$52,655	.....	.....	2,641	$1,708	$3,627	$147,446	$12,217	$45,862	$22,970	$286,485
Bolivia	.....	.....	.....	.....	.....	.....	5,252	.....	.....	.....	5,252
Brazil	8,498	.....	.....	42	62	189	9,095	82	14,970	5,017	37,913
Chile	70,755	288	$1,077	168	136	1,771	133,717	4,073	87,075	39,803	338,407
Colombia	519	.....	.....	72	59	117	860	6	3,713	177	5,451
Ecuador	10	.....	.....	165	150	.....	3,930	.....	42	87	4,219
British Guiana	201	.....	.....	198	298	4	4,624	.....	882	255	6,264
Dutch Guiana	.....	.....	.....	.....	.....	.....	.....	.....	.....	99	99
Peru	5,860	30	182	.....	.....	606	58,939	649	16,424	4,253	86,913
Uruguay	.....	.....	.....	.....	.....	.....	.....	.....	.....	31	31
Venezuela	773	48	216	144	183	145	16,719	336	871	843	20,086
TOTALS, SOUTH AMERICA	$139,271	366	$1,475	3,430	$2,596	$6,459	$380,582	$17,363	$169,839	$73,535	$791,120
ASIA:											
China	$10,523	.....	.....	.....	.....	$1,386	$3,770	.....	.....	$1,488	$17,167
British India	2,059	144	$547	3,464	$2,199	219	38,681	.....	$7,849	4,010	55,564
Straits Settlements	162	.....	.....	240	211	134	21,013	$2,267	127	1,362	25,276
Other British East Indies	301	.....	.....	.....	.....	.....	2,337	.....	.....	.....	2,638
Dutch East Indies	9,986	.....	.....	80	106	515	106,064	1,504	62,117	9,527	189,819
French East Indies	.....	.....	.....	.....	.....	.....	1,514	.....	.....	37	1,551
Hongkong	11,783	.....	.....	124	112	99	5,296	462	.....	657	18,409
Japan	16,423	576	1,512	3,528	2,997	.....	5,660	.....	.....	4,627	31,219
Siam	51	.....	.....	.....	.....	.....	.....	.....	335	514	900
TOTALS, ASIA	$51,288	720	$2,059	7,436	$5,625	$2,353	$184,335	$4,233	$70,428	$22,222	$342,543
OCEANIA:											
Australia	$39,234	.....	.....	10,072	$5,909	$829	$45,056	.....	$5,665	$30,066	$126,759
New Zealand	5,010	504	$1,130	1,560	821	419	19,206	$1,869	2,410	7,510	38,375
French Oceania	10	.....	.....	157	185	.....	280	.....	.....	440	915
German Oceania	.....	.....	.....	.....	.....	.....	604	30	35	368	1,037
Philippine Islands	34,960	.....	.....	.....	.....	.....	28,045	9,349	27,394	14,525	114,273
TOTALS, OCEANIA	$79,214	504	$1,130	11,789	$6,915	$1,248	$93,191	$11,248	$35,504	$52,909	$281,359
AFRICA:											
British West Africa	$4,222	.....	.....	.....	.....	.....	$14,308	.....	.....	.....	$18,530
British South Africa	9,336	24	$72	2,264	$1,247	$463	269	$101	$408	$4,810	16,706
French Africa	.....	.....	.....	.....	.....	.....	131	.....	.....	.....	131
Liberia	.....	.....	.....	120	104	1	.....	.....	.....	.....	105
TOTALS, AFRICA	$13,558	24	$72	2,384	$1,351	$464	$14,708	$101	$408	$4,810	$35,472
TOTALS	$412,803	26,870	$117,173	66,501	$53,024	$58,652	$1,291,534	$66,400	$465,688	$588,119	$3,052,893

(Compiled by the Bureau of Foreign and Domestic Commerce, Department of Commerce, Washington, D. C.)

EXPORTS OF INDIA RUBBER FROM MANAOS DURING THE MONTH OF DECEMBER, 1918.

EXPORTERS.	NEW YORK. Fine.	Medium.	Coarse.	Caucho.	TOTALS.	EUROPE. Fine.	Medium.	Coarse.	Caucho.	TOTALS.	GRAND TOTALS.
F. A. Mendes & Co. ..... *kilos*	366,779	61,487	56,600	75,138	560,004	74,120	.....	.....	.....	74,120	634,124
General Rubber Co. of Brazil	121,635	72,498	15,632	90,235	300,000	75,000	.....	.....	.....	75,000	375,000
Tancredo Porto & Co.	108,825	23,777	46,904	20,294	199,800	45,000	.....	.....	.....	45,000	244,800
Stowell & Co.	76,621	20,407	2,143	21,562	120,723	28,109	.....	.....	.....	28,109	148,832
Adelbert H. Alden, Limited	.....	.....	.....	.....	.....	50,150	.....	.....	.....	50,150	50,150
F. G. Aranio	.....	.....	.....	.....	.....	45,700	.....	.....	.....	45,700	45,700
Higson & Fall	32,451	.....	.....	2,980	35,431	.....	.....	.....	.....	.....	35,431
B. Lévy & Co.	.....	.....	.....	.....	.....	20,000	.....	.....	.....	20,000	20,000
F. Essabbá	.....	.....	.....	.....	.....	15,020	.....	.....	.....	15,020	15,020
Totals	706,311	178,169	121,279	210,199	1,215,958	353,099	.....	.....	.....	353,099	1,569,057

(Compiled by J. Marques, Pará, Brazil.)

EXPORTS OF INDIA RUBBER FROM PARA, MANAOS AND IQUITOS DURING THE YEAR OF 1918.

EXPORTERS.	NEW YORK. Fine.	Medium.	Coarse.	Caucho.	Totals.	EUROPE. Fine.	Medium.	Coarse.	Caucho.	Totals.	Grand Totals.
J. Marques ..... *kilos*	1,042,968	113,096	901,610	424,974	2,482,648	327,696	.....	15,510	21,000	364,206	2,846,854
General Rubber Co. of Brazil....	941,647	87,916	459,942	881,312	2,370,817	327,192	13,038	6,712	.....	346,942	2,717,759
Stowell & Co.....	679,205	172,395	498,096	457,035	1,824,731	495,142	37,982	48,749	.....	581,873	2,406,604
Suarez Filho & Co.....	677,821	.....	56,195	457,245	1,191,261	481,229	.....	.....	.....	481,229	1,672,490
G. Fradelizi & Co.....	301,660	19,161	195,101	153,775	669,697	241,472	8,462	11,221	5,866	267,021	936,718
Bank of Brazil.....	.....	.....	.....	.....	.....	807,414	.....	.....	.....	807,414	807,414
Chamié & Co.....	308,607	21,886	116,131	230,246	676,870	53,858	.....	8,745	10,656	73,259	750,129
Pires, Teixeira & Co.....	267,383	17,073	145,839	151,516	581,811	43,428	3,957	1,132	.....	48,517	630,328
Adelbert H. Alden, Limited.....	308,748	24,825	91,575	25,922	451,070	159,447	.....	.....	.....	159,447	610,517
Bitar & Irmãos	154,455	18,377	36,987	308,187	518,006	19,620	320	780	14,080	34,800	552,806
Sundries	312,799	9,319	114,830	366,843	803,791	177,838	9,463	81,863	97,899	366,565	1,171,866
Exports from Pará.....	4,977,685	484,048	2,616,306	3,476,045	11,554,084	3,139,126	71,120	174,714	151,603	3,546,663	15,078,009
Exports from Manáos.....	4,135,606	545,235	1,311,030	3,254,431	9,246,302	1,947,307	133,978	41,539	95,446	2,218,270	11,464,572
Exports from Iquitos.....	404,604	13,743	104,394	106,175	628,916	394,553	20,820	43,965	91,960	551,298	1,180,214
Totals	9,517,895	1,043,026	4,031,730	6,836,651	21,429,302	5,481,086	225,918	260,218	339,009	6,306,231	27,722,795

(Compiled by J. Marquez, Pará, Brazil.)

EXPORTS OF INDIA RUBBER FROM MANAOS DURING THE YEAR OF 1918.

EXPORTERS.	NEW YORK. Fine.	Medium.	Coarse.	Caucho.	Totals.	EUROPE. Fine.	Medium.	Coarse.	Caucho.	Totals.	Grand Totals.
General Rubber Co. of Brazil. *kilos*	1,266,478	370,596	321,494	1,333,432	3,292,000	239,960	15,040	.....	.....	255,000	3,547,000
F. A. Mendes & Co.....	1,152,601	216,532	536,162	732,475	2,637,770	216,343	340	5,250	.....	221,933	2,859,703
Stowell & Co.....	676,473	151,200	162,405	560,319	1,550,487	214,556	11,200	5,100	26,750	257,606	1,808,093
Tancredo, Porto & Co.....	576,753	104,227	242,017	435,140	1,358,137	146,007	5,366	98	.....	151,471	1,509,608
Bank of Brazil.....	.....	.....	.....	.....	.....	1,199,827	14,429	6,659	.....	1,220,915	1,220,915
G. Fradelizi	90,726	10,727	30,769	72,274	204,496	83,104	3,067	1,025	.....	87,196	291,692
Adelbert H. Alden, Limited.....	63,063	5,831	9,576	88,780	167,250	100,810	.....	.....	.....	100,810	268,060
Higson & Fall.....	67,534	1,855	9,841	16,704	95,934	37,137	4,578	8,511	66,666	116,892	212,826
F. G. Aranjo.....	5,060	.....	420	1,132	6,672	165,304	11,937	9,745	.....	186,986	193,598
Moraes, Carneiro & Co.....	.....	5,000	.....	25,000	30,000	24,080	3,967	193	.....	28,240	58,240
B. Lévy & Co.....	7,607	3,776	2,528	4,846	18,757	33,020	1,806	1,841	757	37,424	56,181
Amorim Irmãos	.....	.....	.....	.....	.....	33,600	6,400	.....	.....	40,000	40,000
F. Essabbá	1,600	400	230	.....	2,230	29,900	320	136	.....	30,356	32,586
Stowell & Sons.....	.....	.....	.....	.....	.....	12,094	.....	.....	.....	12,094	12,094
Sundries	683	160	270	220	1,333	.....	.....	.....	.....	.....	1,333
Totals, Manáos	3,908,578	870,394	1,315,712	3,270,322	9,365,006	2,535,742	78,450	38,558	94,173	2,746,923	12,111,929
In transit, Iquitos	218,406	634,151	132,735	340,346	1,325,638	154,147	47,480	9,470	37,107	248,204	1,573,842
Totals	4,126,984	1,504,545	1,448,447	3,610,668	10,690,644	2,689,889	125,930	48,028	131,280	2,995,127	13,685,771

(Compiled by Stowell & Co., Manáos, Brazil.)

RUBBER STATISTICS FOR THE DOMINION OF CANADA.

[For the fiscal year ended March 31.]

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

Twelve Months Ended March 31.

	1917. Pounds.	1917. Value.	1918. Pounds.	1918. Value.
UNMANUFACTURED—*free:*				
Rubber, gutta percha, etc.:				
From United Kingdom....	4,988,050	$3,286,816	1,557,519	$975,708
British East Indies.	18,079	11,065	313,640	213,350
Straits Settlements.	651,847	418,355	4,405,652	2,651,761
France	95	38	.....	.....
French Guiana	.....	.....	2,540	1,598
Japan	.....	.....	35,286	24,343
Congo Free State..	.....	.....	31,361	16,795
United States	5,099,897	3,028,623	6,749,647	3,728,066
Totals	10,757,968	$6,744,897	13,095,045	$7,611,621
Rubber, recovered:				
From United Kingdom....	148,406	$20,499	11,200	$1,760
British South Africa	11,436	2,783	.....	.....
United States	4,723,323	690,605	4,476,572	720,941
Totals	4,883,165	$713,887	4,487,772	$722,701
Hard rubber in sheets and rods	85,122	$56,271	62,239	$45,062
Rubber substitute.....	631,509	59,442	549,036	59,171
Rubber, powdered, and rubber or gutta percha waste.	1,555,824	106,308	2,106,809	140,234
Rubber thread, not covered.	45,659	68,595	37,456	55,139
Totals	17,959,247	$7,749,400	20,338,957	$8,633,928
Balata, crude	12,906	$9,907	4,036	$3,217
Chicle:				
From British Honduras...	2,930,127	$1,065,953	856,771	$352,028
Mexico	1,379,634	528,632	1,521,635	578,040
United States	1,980,291	685,753	1,177,687	529,407
Totals	6,290,052	$2,280,338	3,556,093	$1,459,475

MANUFACTURED—*dutiable:*	General Tariff. Value.	Preferential Tariff. Value.	General Tariff. Value.	Preferential Tariff. Value.
Boots and shoes:				
From United Kingdom....	.....	$10,579	.....	$41,134
United States.....	$186,682	.....	$264,954	.....
Totals	$186,682	$10,579	$264,954	$41,134
Waterproof clothing.....	$294,393	$432,624	$173,953	$256,479
Belting, hose, and packing..	271,496	1,870	342,390	9,087
Rubber tires for all vehicles.	1,246,478	27,565	2,030,484	21,958
Other manufactures	1,075,605	221,673	970,023	258,805
Totals, manufactured	$3,074,654	$694,311	$3,781,804	$587,463

EXPORTS OF DOMESTIC AND FOREIGN MERCHANDISE.

Twelve Months Ended March 31.

MANUFACTURED—	1917. Produce of Canada. Value.	1917. Reexports of Foreign Goods. Value.	1918. Produce of Canada. Value.	1918. Reexports of Foreign Goods. Value.
Boots and shoes.....	$1,317,725	$812	$1,504,389	$9,124
Belting	4,879	11	25,736	689
Waterproof clothing	2,504	472	6,833	1,042
Rubber-lined hose	233,423	529	159,288	570
Tires	726,768	46,491	.....	.....
Scrap rubber	229,609	.....	262,700	.....
All other, n. o. p.....	151,598	15,735	92,847	2,856,885
Totals	$2,666,506	$64,050	$2,051,793	$2,868,310
Chicle	$2,353,987	$2,078	$1,816,673	$555

RUBBER STATISTICS FOR THE DOMINION OF CANADA.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

November.

	1917. Pounds.	1917. Value.	1918. Pounds.	1918. Value.
UNMANUFACTURED—*free:*				
Rubber, gutta percha, etc.:				
From United Kingdom....	35,284	$20,591	54,604	$24,172
United States.....	665,481	330,744	155,833	56,325
Straits Settlements.....	311,856	193,819	453,826	209,198
Other countries.....	56,100	32,319	128,110	52,999
Totals	1,058,721	$577,473	792,373	$342,694
Rubber, recovered	369,745	$61,828	431,759	$54,003
Hard rubber sheets and rods.	7,499	5,846	2,540	2,581
Rubber, powdered, and rubber or gutta percha scrap.....	192,846	14,372	61,209	13,598
Rubber thread, not covered..	3,522	5,204	2,420	3,520
Rubber substitute	49,746	4,038	134,942	12,901
Totals	1,682,079	$668,761	1,425,243	$429,297
Balata, crude	.....	.....	20	20
Chicle	151,813	58,895	41,812	28,852
MANUFACTURED—*dutiable:*				
Boots and shoes.....	.....	$29,443	.....	$15,349
Belting, hose and packing....	.....	26,735	.....	35,182
Waterproof clothing	.....	20,788	.....	4,414
Tires	.....	48,431	.....	35,373
Other manufactures	.....	97,429	.....	122,667
Totals	.....	$222,826	.....	$212,985

UNITED KINGDOM RUBBER STATISTICS.

IMPORTS.

	Year Ended December 31. 1917. Pounds.	1917. Value.	1918. Pounds.	1918. Value.
UNMANUFACTURED—				
Crude rubber:				
From—				
Dutch East Indies	14,128,400	£1,937,039	7,805,500	£932,287
French West Africa	914,200	78,132	304,100	25,559
Gold Coast	2,594,000	141,434	785,500	60,747
Other African countries	7,806,000	801,922	6,476,900	602,396
Peru	1,187,500	140,096	850,500	94,258
Brazil	23,862,700	3,344,676	9,550,900	1,201,943
British India	4,729,100	639,666	4,378,500	519,123
Straits Settlements and dependencies, including Labuan	40,749,500	5,651,670	28,697,300	3,259,738
Federated Malay States	48,967,100	6,822,112	16,399,600	1,952,257
Ceylon and dependencies	26,291,900	3,642,901	27,173,000	3,172,601
Other countries	4,352,700	581,698	2,644,400	305,613
Totals	175,583,100	£23,781,346	105,066,200	£12,126,522
Waste and reclaimed rubber	2,890,500	70,962	238,100	3,508
Totals	178,473,600	£23,853,308	105,304,300	£12,130,030
Gutta percha	7,192,300	1,111,578	10,548,800	£1,973,534
MANUFACTURED—				
Boots and shoes—*dozen pairs*	140,895	£253,580	30,841	£241,454
Waterproof clothing	.....	9,047	.....	22,117
Carriage tires and tubes	.....	7,977	.....	242
Automobile tires and tubes	.....	1,161,989	.....	602,645
Motorcycle tires and tubes	.....	79,722	.....	15,573
Bicycle tires and tubes	.....	73,178	.....	20,414
Insulated wire	.....	35,756	.....	2,220
Totals	.....	£1,621,249	.....	£904,665

EXPORTS.

UNMANUFACTURED—				
Waste and reclaimed rubber	16,205,800	£296,152	7,108,200	£183,858
MANUFACTURED—				
Waterproof clothing	.....	£660,134	.....	£479,224
Boots and shoes—*dozen pairs*	103,139	114,919	89,220	124,371
Insulated wire	.....	161,647	.....	89,876
Submarine cables	.....	217,295	.....	578,544
Carriage tires and tubes	.....	130,882	.....	153,385
Automobile tires and tubes	.....	1,108,636	.....	1,121,446
Motorcycle tires and tubes	.....	134,952	.....	153,644
Bicycle tires and tubes	.....	334,855	.....	261,686
Other rubber manufactures	.....	1,641,391	.....	1,479,962
Totals	.....	£4,504,711	.....	£4,442,138

EXPORTS—FOREIGN AND COLONIAL.

UNMANUFACTURED—				
Crude rubber:				
To—				
Russia	8,971,000	£1,183,410	.....	.....
France	29,035,200	22,287,700	4,066,507	£2,695,580
United States	67,968,400	5,872,900	9,605,905	680,715
Other countries	11,486,300	9,470,900	1,643,973	1,151,284
Totals	117,460,900	£16,499,795	37,631,315	£4,527,579
Waste and reclaimed rubber	555,700	21,058	7,980	2,825
Totals	118,016,600	£16,520,853	37,711,300	£4,530,404
Gutta percha	351,500	247,800	50,722	43,697
MANUFACTURED—				
Boots and shoes—*dozen pairs*	27,376	£34,961	893	£4,257
Waterproof clothing	.....	532	.....	121
Insulated wire	.....	79,622	.....	3,224
Carriage tires and tubes	.....	2,528	.....	1,639
Automobile tires and tubes	.....	405,573	.....	56,522
Motorcycle tires and tubes	.....	15,288	.....	897
Bicycle tires and tubes	.....	10,162	.....	9,291
Totals	.....	£548,866	.....	£75,941

RUBBER STATISTICS FOR ITALY.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

	Nine Months Ended September 30. 1917. Quintals.[1]	1917. Lire.[2]	1918. Quintals.	1918. Lire.
UNMANUFACTURED—				
India rubber and gutta percha—raw and reclaimed:				
From Great Britain	8,561	.....	6,111	.....
India and Ceylon	13,508	.....	5,760	.....
Straits Settlements	5,800	.....	24,074	.....
French Africa	1,162	.....	4,504	.....
Belgian Congo	1,065	.....	251	.....
Brazil	17,760	.....	13,812	.....
Other countries	850	.....	2,434	.....
Totals	48,706	53,576,600	56,946	62,640,600
Rubber scrap	7,915	949,800	1,781	213,720
MANUFACTURED—				
India rubber and gutta percha—				
Threads	341	750,200	498	1,095,600
Sheets:				
Cut sheets	5	11,000	2	4,400
Elastic fabric	6	4,200	.....	.....
Other kinds, including hard rubber	101	121,200	161	193,200
Tubes:				
From cut sheets	1	2,200	4	8,800
Elastic fabric	50	45,000	87	78,300
Other forms	6	6,600	2	2,200
Belting	366	402,600	410	451,000
Rubber-coated fabrics—*pieces:*				
For carding combs	323	419,900	149	193,700
Other forms	158	237,000	8	12,000
Boots and shoes—*pairs:*				
From France	6,046		27,565	
United States	19,023	302,856	3,472	377,928
Other countries	169		457	
Elastic webbing	234	468,000	194	388,000
Clothing and articles for travel	7	21,000	15	45,000
Manufactures n. e. s.:				
From cut sheets	52	135,200	28	72,800
Elastic fabric	1,007	1,208,400	1,078	1,293,600
Tires and tubes:				
From France	3,142		1,982	
Great Britain	1,741	8,980,200	444	4,368,600
Other countries	106		1	
Other rubber manufactures:				
From France	794		1,692	
Great Britain	1,496	5,355,600	2,651	5,476,800
United States	2,168		218	
Other countries	5		3	
Totals, manufactured	...	18,471,156	.....	14,061,928
Total imports	...	72,977,556	.....	76,916,248

EXPORTS OF CRUDE AND MANUFACTURED RUBBER.

UNMANUFACTURED—				
India rubber and gutta percha—raw and reclaimed:				
To Spain	1,548	.....	1,299	.....
United States	2,529	.....	782	.....
Totals	4,068	1,423,800	2,081	728,350
MANUFACTURED—				
India rubber and gutta percha—				
Threads	218	479,600	30	66,000
Sheets:				
Cut sheets	6	12,000	21	42,000
Elastic fabric	25	20,000	22	17,600
Insulated wire	2	1,000	3	1,500
Other forms, including hard rubber	81	81,000	22	22,000
Tubes:				
From cut sheets	6	13,200	19	41,800
Elastic fabric	197	157,600	109	87,200
Other forms	266	252,700	108	102,600
Belting	12	12,000	85	85,000
Rubber-coated fabrics...*pieces*	168	201,600	40	48,000
Elastic webbing	1,582	3,005,800	881	1,673,900
Clothing and articles for travel	33	92,400	8	22,400
Manufactures n. e. s.:				
From Cut sheets	56	123,200	45	99,000
Elastic fabric	102	112,200	89	97,900
Tires and tubes:				
To France	2,373	.....	2,857	.....
Great Britain	6,883	.....	1,773	.....
Spain	127	.....	82	.....
Switzerland	9	.....	2	.....
India and Ceylon	1,679	.....	51	.....
Dutch East Indies	350	.....	441	.....
Straits Settlements	1,535	.....	.....	.....
Australia	2	.....	95	.....
Argentina	961	.....	191	.....
Brazil	1,089	.....	434	.....
Other countries	903	.....	366	.....
Totals, tires	15,911	20,684,300	6,292	8,179,600
Other rubber manufactures:				
To France	193	.....	152	.....
Great Britain	167	.....	103	.....
Spain	28	.....	7	.....
Switzerland	154	.....	116	.....
Egypt	15	.....	27	.....
Argentina	392	.....	94	.....
Brazil	154	.....	46	.....
Uruguay	71	.....	8	.....
Other countries	139	.....	91	.....
Totals	1,313	1,313,000	644	644,000
Total exports	...	27,985,400	.....	11,958,850

[1] A quintal = 220.46 pounds.
[2] A lira = $0.193.

THE MARKET FOR COTTON AND OTHER FABRICS.

NEW YORK.

THE American cotton market has been fairly steady during the month when, with minor fluctuations, spot middling uplands has held around 26 cents. The steady undertone is due to current belief in the strong financial and commercial position of this country, and the certain prospects of increasing export trade in cotton. Lower prices, therefore, are not expected in the near future.

EGYPTIAN COTTON. It is estimated that the 1918 crop will amount to about five million cantars but on account of the quantity of the 1917 crop which was carried over and ginned with the 1918 crop, the final statistics will probably show about 5,400,000 cantars. A cantar is approximately 98 pounds.

It is doubtful if there will be enough cotton to cover present sales of government type No. 1. Owing to the poor quality of the crop, Sakellarides types of extra staple will be very scarce.

SEA ISLAND COTTON. The southern markets have been exceedingly quiet and quotations are nominal. From August 1, 1918, to January 31, 1919, 38,104 bales were received, compared with 47,813 bales last year. After deducting exports, the stock on hand was 15,268 bales, compared with 17,207 bales last year. On January 31, 1919, the crop in sight at all ports was 22,340 bales, compared with 46,599 bales a year ago.

DUCKS, DRILLS, AND OSNABURGS. While market conditions are not what they should be at this time, they are better than last month, owing to a noticeably better demand. Prices have declined.

RAINCOAT FABRICS. A few large sales were reported last month but nearly all orders were very small and for spot deliveries. Buyers who have kept out of the market for a long period may be at a disadvantage when the necessity comes for placing quantity orders.

TIRE FABRICS. Although the market was generally quiet and prices easier than a month ago, there has been a steady demand for comparatively small stocks for immediate delivery. Quotations are slightly lower than at this time last month and in fact considerably lower than a year ago when there was no immediate prospect of industrial activity.

NEW YORK QUOTATIONS.

FEBRUARY 24, 1919.

Prices subject to change without notice.

AIRPLANE AND BALLOON FABRICS:			
Wamsutta, S. A. I. L. No. 1, 40-inch	*yard*	.60	@
No. 4, 38½-inch		.50	@
ASBESTOS CLOTH:			
Brake lining, 2½ lbs. sq. yd., brass or copper insertion	*lb.*	*.85	@
2¼ lbs. sq. yd., brass or copper insertion	*lb.*	*.90	@
BURLAPS:			
32— 7-ounce	*100 yards*	6.25	@
32— 8-ounce		6.60	@
40— 7½-ounce		7.25	@
40— 8-ounce		7.40	@
40—10-ounce		10.75	@
40—10½-ounce		11.00	@
45— 7½-ounce			none
45— 8-ounce		9.50	@
45— 9½-ounce			none
48—10-ounce		15.75	@
DRILLS:			
38-inch 2.00-yard	*yard*	.24½	@
40-inch 2.47-yard		.23	@
52-inch 1.90-yard		.28½	@
52-inch 1.95-yard		.27¾	@
60-inch 1.52-yard		.35⅝	@
DUCK:			
CARRIAGE CLOTH:			
38-inch 2.00-yard enameling duck	*yard*	.27½	@
38-inch 1.74-yard		.31⅝	@
72-inch 16.66-ounce		.57¼	@
72-inch 17.21-ounce		.60¼	@
MECHANICAL:			
Hose	*pound*	*.62¾	
40-inch, 10-ounce		*.64¾	
Belting		*.62¾	
HOLLANDS, 40-INCH:			
Acme	*yard*	.28	@
Endurance	*yard*	.30	@
Penn	*yard*	.32	@
OSNABURGS:			
40-inch 2.35-yard	*yard*	.23⅞	@
40-inch 2.48-yard		.22⅝	@
37½-inch 2.42-yard		.23¼	@

RAINCOAT FABRICS:				
COTTON:				
Bombazine 64 x 60 water-repellent	*yard*	.13¼	@	
60 x 48 not water-repellent		.11¾	@	
Cashmeres, cotton and wool, 36-inch, tan		.80	@	
cotton and wool 36-inch plain		.33½	@	
Oxford		.65	@	
blue and black		.75	@	
Twills 64 x 72		.30	@	.32½
64 x 102		.35	@	.40
Twill, mercerized, 36-inch, tan and olive		.27½	@	
blue and black		.29	@	
Tweed		.55	@	.72
Tweed, printed	*yard*	.16	@	.22
Plaids 60 x 48		.12½	@	
56 x 44		.12	@	
Repp		.36½	@	.43
Surface prints 60 x 48		.13¼	@	
64 x 60		.15	@	
IMPORTED WOOLEN FABRICS SPECIALLY PREPARED FOR RUBBERIZING —PLAIN AND FANCIES:				
63-inch, 3¼ to 7½ ounces	*yard*	1.15	@	3.25
36-inch, 2¼ to 5 ounces		.80	@	1.85
IMPORTED PLAID LINING (UNION AND COTTON):				
63-inch, 2 to 4 ounces	*yard*	.90	@	1.70
36-inch, 2 to 4 ounces		.52½	@	1.05
DOMESTIC WORSTED FABRICS:				
36-inch, 4½ to 8 ounces	*yard*	.60	@	1.50
DOMESTIC WOVEN PLAID LININGS (COTTON):				
36-inch, 3¾ to 5 ounces	*yard*	.18	@	.32½
SHEETINGS:				
JACKET:				
Delaware	*yard*	.28	@	
Schuylkill	*yard*	.30	@	
SILKS:				
Canton, 38-inch	*yard*	.36½	@	
Schappe, 36-inch		.55	@	

TIRE FABRICS:				
17¼-ounce Sea Island, combed	*square yard*	1.45	@	
17¼-ounce Egyptian, combed		1.20	@	1.25
17¼-ounce Egyptian, carded		1.15	@	1.20
17¼-ounce Peelers, combed		1.10	@	1.12
17¼-ounce Peelers, carded		.85	@	.90

*Nominal.

THE MARKET FOR CHEMICAL AND COMPOUNDING INGREDIENTS.

NEW YORK.

MARKET conditions on the base metals, lead, zinc, and antimony, have been quiet and dull during the past month and curtailment of output continues with regard to pig lead. The rubber trade in general is showing a decided improvement in buying activity, indicating confidence on the part of manufacturers, which doubtless will increase as knowledge is gained of the readjustment of economic factors involved in world peace. Prices are easing off and the general demand for price reduction is being anticipated in most lines.

ANILINE.—The decline of prices has resulted in improved demand which has now become active.

CARBON TETRACHLORIDE.—The demand continues rather light and prices steady.

BENZOL.—Similar conditions hold with regard to benzol as in the case of carbon tetrachloride.

DRY COLORS.—The demand is very light and prices tend to recede.

LITHARGE.—Quiet routine market with prices fixed.

LITHOPONE.—There has been some improvement in demand and the spring outlook is said to be decidedly good. Manufacturers are anticipating lower costs on their crude materials for the second quarter of the year.

PINE TAR and similar pitches are in very good demand by the rubber trade at fair prices.

SUBSTITUTES.—Prices are easing off rather more than is indicated in the limit prices given. Crude stocks are generally lower.

WHITING.—There has been a steady demand and unchanging prices. Imports are not yet increased. Consequently the short supply does not permit reduction in prices.

ZINC OXIDE.—Market conditions are very steady and no immediate change is anticipated by the manufacturers.

NEW YORK QUOTATIONS.

FEBRUARY 24, 1919.

Prices subject to change without notice.

ACCELERATORS, ORGANIC.				
Accelerator N. C. C.	*lb.*	*.50	@	
Accelerator No. 1	*lb.*	*.60	@	
Accelerene	*lb.*	3.70	@	
Accelemal	*lb.*	.65	@	
Aldehyde ammonia crystals	*lb.*	1.00	@	1.25
Aniline oil	*lb.*	.25	@	.27
Excellerex	*lb.*	.85	@	
Hexamethylene tetramine (powdered)	*lb.*	1.15	@	1.25
Paraphenylenediamine	*lb.*	3.50	@	
Tensolite	*lb.*	.50	@	
Thiocarbanilide	*lb.*	.50	@	
Velocite	*lb.*	.60	@	
ACCELERATORS, INORGANIC.				
Lead, dry red (bbls.)	*lb.*	.10¼	@	
sublimed blue (bbls.)	*lb.*	.08½	@	
sublimed white (bbls.)	*lb.*	.08¼	@	
white, basic carbonate (bbls.)	*lb.*	.09	@	
Lead oleate	*lb.*	.27	@	
Lime, flour	*lb.*	.02	@	
Litharge, domestic	*lb.*	.09¾	@	
Imported	*lb.*	.12½	@	
sublimed	*lb.*	.10	@	
Magnesium, carbonate	*lb.*	.12½	@	
Diatomite	*lb.*	.03	@	
calcined heavy (Thistle)	*lb.*	.12	@	
light (Manhattan)	*lb.*	.45	@	
Magnesium oxide, light	*lb.*	.25	@	
medium heavy	*lb.*	.07	@	
Magnesite, calcined, powdered	*ton*	50.00	@	
ACIDS.				
Acetic, 28 per cent (bbls.)	*cwt.*	3.25	@	4.00
Glacial, 99 per cent (carboys)	*lb.*	14.25	@	15.00
Glacial, 99 per cent (carboys)	*cwt.*	1.07	@	1.12
95 per cent, dark	*gal.*	.97	@	1.02
Muriatic, 20 degrees	*cwt.*	1.60	@	1.90
Nitric, 36 degrees	*cwt.*	6.60	@	6.85
Sulphuric, 66 degrees	*ton*	21.00	@	25.00
ALKALIES.				
Caustic soda, 76 per cent (bbls.)	*lb.*	.07	@	
Soda ash (bbls.)	*lb.*	.04	@	
COLORS.				
Black:				
Bone, powdered	*lb.*	.05	@	
granulated	*lb.*	.09	@	
Carbon, black (sacks, factory)	*lb.*	.15	@	.25
Drop	*lb.*	.06½	@	
Ivory black	*lb.*	.16	@	
Lampblack	*lb.*	.15	@	
Oil soluble aniline	*lb.*	1.00	@	
Rubber black	*lb.*	.07	@	
Blue:				
Cobalt	*lb.*	.25	@	.35
Prussian	*lb.*	1.10	@	
Ultramarine	*lb.*	.18	@	.50
Brown:				
Iron oxide	*lb.*	.04	@	
Ochre, domestic	*lb.*	*.02	@	.04
imported	*lb.*	*.05½	@	.08
Sienna, Italian, raw and burnt	*lb.*	.07	@	.15
Umber, Turkey, raw and burnt	*lb.*	.06	@	
Green:				
Chrome tile	*lb.*	.16	@	
Oxide of chromium (casks)	*lb.*	.75	@	
Red:				
Antimony, crimson, sulphuret of (casks)	*lb.*	.48	@	
crimson, "Mephisto" (casks)	*lb.*	.55	@	
Antimony, golden, sulphuret of (casks)	*lb.*	.27	@	
golden, "Mephisto" (casks)	*lb.*	.28	@	
golden sulphuret (States)	*lb.*	.28	@	
red sulphuret (States)	*lb.*	.25	@	
vermilion sulphuret	*lb.*	.55	@	
Arsenic, red sulphide	*lb.*	.30	@	
Indian, pure bright	*lb.*	.09	@	
Iron oxide, reduced grades	*lb.*	.12	@	
pure bright	*lb.*	.16	@	
Oil soluble aniline, red	*lb.*	2.00	@	
orange	*lb.*	1.25	@	
Oximony	*lb.*	.18	@	
Venetian	*lb.*	.02½	@	
Vermilion, English, pale, medium, dark	*lb.*	1.65	@	
White:				
Aluminum bronze	*lb.*	.75	@	
C. P. (cases)	*lb.*	.65	@	.69
superior	*lb.*	.70	@	.75
Lithopone, imported	*lb.*	None		
domestic	*lb.*	.07¼	@	.07¾
Ponolith (carloads, factory)	*lb.*	.06⅞	@	.07
(less carloads, factory)	*lb.*	.07¼	@	
Zinc oxide, Horsehead (less carload, factory):				
"XX red"	*lb.*	.10½	@	
"Special"	*lb.*	.10¾	@	
French process, red seal	*lb.*	.12½	@	
green seal	*lb.*	.12¾	@	
white seal	*lb*	.13¼	@	
(States)	*lb.*	.09⅞	@	
Zinc sulphide	*lb.*	.07¼	@	.07¾
Yellow:				
Cadmium, tri-sulphate	*lb.*	*2.68	@	
sulphide, yellow, light, orange	*lb.*	2.00	@	
red	*lb.*	1.85	@	
Chrome, light and medium	*lb.*	.30	@	
Ochre, light or dark	*lb.*	.03	@	.04
Oil soluble aniline	*lb.*	1.20	@	
Zinc chromate	*lb.*	.55	@	
COMPOUNDING INGREDIENTS.				
Aluminum flake (bbls. factory. Less 5% carload)	*ton*	29.00	@	
(sacks factory. Less 5% carloads)	*ton*	26.00	@	
Aluminum oxide	*lb.*	*.18	@	
Ammonia carbonate, powdered	*lb.*	.14	@	.14½
Asbestine (carloads)	*ton*	15.50	@	20.00
Asbestos (bags)	*ton*	30.00	@	
Barium, carbonate, precipitated	*ton*	60.00	@	65.00
sulphide, precipitated	*lb.*	.07	@	.07¼
Barytes, pure white	*ton*	35.00	@	
off color	*ton*	25 00	@	
uniform floated	*ton*	35.00	@	
Basofor	*lb.*	.04½	@	
Blanc fixe	*lb.*	.04½	@	
Bone ash	*lb.*	.06	@	
Chalk, precipitated, extra light	*lb.*	.05	@	.05½
precipitated, heavy	*lb.*	.04	@	.04½
China clay, domestic	*lb.*	.15	@	.20
imported	*lb.*	.18	@	.25
Cork flour	*lb.*	.30	@	
Cotton linters, clean mill run, f. o. b. factory	*bale*	None		
Fossil flour (powdered)	*ton*	60.00	@	
(bolted)	*ton*	65.00	@	
Glue, high grade	*lb.*	.36	@	
medium	*lb.*	.31	@	
low grade	*lb.*	.22	@	
Graphite, flake (400 pound bbl.)	*lb.*	.10	@	.25
amorphous	*lb.*	.04	@	.08
Ground glass FF. (bbls.)	*lb.*	.03	@	
Infusorial earth (powdered)	*ton*	60.00	@	
(bolted)	*ton*	65.00	@	
Mica, powdered	*lb.*	.03½	@	.05
Plaster of Paris	*lb.*	3.00	@	
Pumice stone, powdered (bbl.)	*lb.*	.05	@	
Rotten stone, powdered	*lb.*	.02½	@	.04½
Rubber flux	*lb.*	*.15	@	
Rub-R-Glu	*lb.*	*.20	@	.25
Silex (silica)	*ton*	22.00	@	

Soapstone, powdered, domestic	*ton*	25.00 @	40.00
Starch, powdered corn (carload, bbls.)	*cwt.*	4.24 @	
(carload, bags)	*cwt.*	4.02 @	
Talc, American	*ton*	22.50 @	
French	*ton*	None	
Tripoli earth, powdered	*lb.*	.01½ @	
Tyre-lith	*ton*	80.00 @	85.00
Whiting, Alba (carloads)	*cwt.*	.80 @	.90
commercial	*cwt.*	1.25 @	
gilders	*cwt.*	1.30 @	1.35
Paris, white, American	*cwt.*	1.50 @	1.75
English cliffstone	*cwt.*	1.75 @	2.75
Wood pulp, imported	*lb.*	.02½ @	
Wood flour, American	*lb.*	.01½ @	

MINERAL RUBBER.

Gilsonite	*ton*	47.50 @	50.00
Genasco (carloads factory)	*ton*	55.00 @	
(less carloads factory)	*ton*	57.00 @	
M. R.	*ton*	*65.00 @	
M. R. X.	*ton*	100.00 @	
Liquid rubber	*lb.*	.15 @	
Pioneer, carload, factory	*ton*	*50.00 @	
less carload, factory	*ton*	*55.00 @	
Richmond	*ton*	75.00 @	
No. 64	*ton*	50.00 @	
318/320 M. P. hydrocarbon	*ton*	45.00 @	50.00
Refined Elaterite	*ton*	40.00 @	60.00
Raven M. R.	*ton*	*.06 @	
Rubpron (carloads, factory)	*ton*	50.00 @	
(less car, factory)	*ton*	60.00 @	
Walpole rubber flux (factory)	*lb.*	175.00 @	

OILS.

Castor, No. 1, U. S. P.	*lb.*	.29 @	
No. 2, U. S. P.	*lb.*	.28 @	
No. 3, U. S. P.	*lb.*	.22 @	
Corn, crude (bbls.)	*lb.*	.16 @	
refined Argo	*cwt.*	16.56 @	
Cotton	*lb.*	.20 @	
Glycerine (98 per cent)	*lb.*	.21 @	.27
Glycerole	*lb.*	.12½ @	
Linseed, raw (carloads)	*gal.*	1.45 @	
Linseed compound	*gal.*	1.00 @	
Palm (Niger)	*lb.*	.22 @	
Peanut	*lb.*	.17 @	
Petrolatum O.	*lb.*	.08 @	
Petroleum grease	*lb.*	.06 @	
Pine, steam distilled	*gal.*	.66 @	
Pine tar	*gal.*	.34 @	
Rapeseed, refined	*lb.*	.21 @	
blown	*lb.*	1.60 @	
Rosin	*gal.*	.82 @	
Soya bean	*lb.*	.14 @	
Tar, commercial (cases)	*gal.*	.35 @	.36
Noreacol No. 30	*gal.*	.65 @	

SOLVENTS.

Acetone (98-99 per cent drums)	*lb.*	.23 @	
methyl (bbls.)	*gal.*	1.10 @	
Benzol, C. P. (drums)	*gal.*	.25 @	
90 per cent	*gal.*	.22 @	.27
Beta-naphthol, resublimed	*lb.*	.90 @	
ordinary grade	*lb.*	.55 @	
Carbon bisulphide (drums)	*lb.*	.06½ @	
tetrachloride (drums)	*lb.*	.15½ @	
Naphtha, motor gasoline (steel bbls.)	*gal.*	.24½ @	
73 @ 76 degrees (steel bbls.)	*gal.*	None	
68 @ 70 degrees (steel bbls.)	*gal.*	None	
Solvent	*gal.*	.20 @	
V. M. & P. (steel bbls.)	*gal.*	.23½ @	
Toluol, pure	*gal.*	.25 @	.35
Turpentine, spirits	*gal.*	.70 @	.71
wood	*gal.*	.61 @	.64
Osmaco reducer	*gal.*	.35 @	
Xylol, pure	*gal.*	.45 @	.50
commercial	*gal.*	.35 @	

SUBSTITUTES.

Black	*lb.*	.17 @	.24
White	*lb.*	.13 @	.24
Brown	*lb.*	.10 @	.16
Brown factice	*lb.*	.07½ @	.23
White factice	*lb.*	.12 @	.23
Paragol soft and medium (carloads)	*cwt.*	17.08 @	
hard	*cwt.*	16.58 @	

VULCANIZING INGREDIENTS.

Lead, black hyposulphite (Black Hypo)	*lb.*	.39 @	
Orange mineral, domestic	*lb.*	.13¼ @	
Sulphur chloride (drums)	*lb.*	.06½ @	.07
Sulphur, flour, Brooklyn brand (carloads)	*cwt.*	2.95 @	
pure soft (carloads)	*cwt.*	2.90 @	
superfine (carloads, factory)	*cwt.*	*2.50 @	

(See also Colors—Antimony)

RESINS AND PITCHES.

Cantella gum	*lb.*	.70 @	
Pine tar, retort	*bbl.*	15.00 @	
kiln	*bbl.*	14.00 @	
Pitch, Burgundy	*lb.*	.08¼ @	
coal tar	*lb.*	.01½ @	
pine tar	*bbl.*	.04¼ @	
ponto	*lb.*	.14 @	
Resin, Pontianak, refined	*lb.*	None	
granulated	*lb.*	None	
fused	*lb.*	None	
Rosin, K	*lb.*	.07 @	
powdered	*lb.*	.17 @	
Shellac, fine orange, V. S. O.	*lb.*	.78 @	
D. C.	*lb.*	.80 @	
Tar, kiln	*bbl.*	12.75 @	
retort	*bbl.*	13.75 @	

WAXES.

Wax, beeswax, white	*lb.*	.68 @	.70
ceresin, white	*lb.*	.18 @	.18½
carnauba	*lb.*	.50 @	.80
ozokerite, black	*lb.*	.60 @	
green	*lb.*	.80 @	
montan	*lb.*	.30 @	.33
substitute	*lb.*	.20 @	.30
paraffin, refined 118/120 m. p. (cases)	*lb.*	.11¾ @	
128/120 m. p. (cases)	*lb.*	.12½ @	

*Nominal.

THE MARKET FOR RUBBER SCRAP.

NEW YORK.

DURING the month of February the market for scrap rubber has been extremely quiet. Stocks throughout the country are large and constantly increasing. The reclaimers are far from busy and are anxiously awaiting the resumption of a normal demand for their product.

The impending influx of crude rubber from the Far East has a depressing effect on the prices of scrap rubber, since there seems to be no possibility of a marked advance in crude rubber prices. Scrap shoes and tires must come down to a basis which will permit competition with prices for new rubber. It is not a pleasant prospect, but it looks as though dealers in scrap rubber will find it expedient to devote their attention to other waste materials during the dull period.

BOOTS AND SHOES.—Scrap rubber dealers who are working on old orders are offering more for old shoes than any mill will offer. The price is nominal at 8 cents.

INNER TUBES.—Practically no demand.

MECHANICALS.—No inquiries at all. Prices unchanged.

TIRES.—Quotations for mixed remain at 5 cents with no sales worth mentioning.

NEW YORK QUOTATIONS FOR CARLOAD LOTS DELIVERED.

FEBRUARY 24, 1919.

Prices subject to change without notice.

BOOTS AND SHOES.

Arctic tops	*lb.*	.01¼ @	
Boots and shoes	*lb.*	.07½ @	.08
Trimmed arctics	*lb.*	.06½ @	.06¾
Untrimmed arctics	*lb.*	.05½ @	.05¾

HARD RUBBER.

Battery jars, black compound	*lb.*	*.01 @	
No. 1, bright fracture	*lb.*	.25 @	

INNER TUBES.

No. 1, old packing	*lb.*	.22 @	
new packing	*lb.*	.24½ @	
No. 2	*lb.*	.11½ @	.11¾
Red	*lb.*	.11¼ @	.11½

MECHANICALS.

Black scrap, mixed, No. 1	*lb.*	.04½ @	
No. 2	*lb.*	.03¾ @	
Car springs	*lb.*	.04½ @	
Heels	*lb.*	.03½ @	.03¾
Horse-shoe pads	*lb.*	.04 @	.04¼
Hose, air-brake	*lb.*	.05 @	.05¼
fire, cotton lined	*lb.*	.02 @	.02½
garden	*lb.*	.01½ @	.01¾
Insulated wire stripping, free from fiber	*lb.*	.03½ @	.03¾
Matting	*lb.*	*.01½ @	
Packing	*lb.*	*.01½ @	
Red scrap, No. 1	*lb.*	.09½ @	.10
No. 2	*lb.*	.07 @	.07½
White scrap, No. 1	*lb.*	.12 @	
No. 2	*lb.*	.09 @	.09½

TIRES.

PNEUMATIC:

Auto peelings, No. 1	*lb.*	.10 @	.10½
No. 2	*lb.*	.06¼ @	.06½
Bicycle	*lb.*	.04 @	.04½
Standard white auto	*lb.*	.05½ @	.05¾
Standard mixed auto	*lb.*	.04½ @	.04¾
Stripped, unguaranteed	*lb.*	.03¼ @	.03½
White, G. & G., M. & W. and U. S.	*lb.*	.05½ @	.05¾

SOLID:

Carriage	*lb.*	.04½ @	.04¾
Irony	*lb.*	.01 @	
Truck	*lb.*	.04¼ @	.04½

*Nominal.

INDIA RUBBER WORLD
FOUNDED 1889
CAOUTCHOUC GUTTA-PERCHA

Vol. 59. MARCH 1, 1919. No. 6.

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